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# Transforming I&O Skills to Remain Viable Through 2022 and Beyond

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FOUNDATIONAL   This research is reviewed periodically for accuracy.

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Initiatives: Infrastructure and Operations Leaders

I&O leaders face changing business and technical requirements so diverse that, without wholesale skills transformation, their organizations risk becoming obsolete. Transforming their leadership and operational skills is key for I&O leaders adapting to a world of digital business expectations.

## Overview

### Impacts

- The needs of business and IT organizations will change radically over the next several years, which will require innovative methods to manage skills by I&O leaders.

- Megatrends such as machine learning, advanced analytics, DevOps and digital business will alter the types and quantities of the skills required.

- I&O leaders' traditional methods of growing skills will be inadequate to address the significance of the changes.

### Recommendations

I&O leaders should:

- Conduct an I&O skills inventory by defining the necessary skills needed for future roles and assessing current staff.

- Invest in a skills transformation program by creating a three- to five-year roadmap of skills needed for future I&O and business requirements.

- Implement a prioritized set of methods to change the skills portfolio of the I&O organization by creating a skills roadmap that emphasizes connected learning, digital dexterity, collaboration and problem solving.

- Accelerate the decommissioning of skills that will be of less value in the future by prioritizing I&O skills based on future need.

## Strategic Planning Assumption

Through 2022, traditional I&O skills will be insufficient for 60% of the operational tasks that I&O leaders are responsible for.

## Analysis

Many I&O leaders can't continue the traditional evolution of technically oriented skills in a haphazard way. Instead, I&O senior leadership must take a systematic approach to establishing and executing a plan for skills transformation, taking into account industry trends and the unique dynamics of the business they support (see Figure 1).

**Figure 1. Impacts and Top Recommendations for I&O Leaders**



## Impacts and Top Recommendations for I&O Leaders

| Impacts | Top Recommendations |
|---|---|
| Skills today bear little resemblance to those that will be required in 10 years. | • Invest in a skills transformation program.<br>• Actively explore emerging skills that promote digital dexterity, problem solving and collaboration. |
| Megatrends such as machine learning, advanced analytics, DevOps and digital business will alter the types and quantities of skills required. | • Implement a prioritized set of methods to change the skills portfolio of the I&O organization.<br>• Devote 25% of the training and development budget for skills beyond current needs. |
| I&O leaders' traditional methods of growing skills will be inadequate to address the significance of the changes. | • Actively decommission skills that will be of less value in the future.<br>• Establish alternative training methods that emphasize connected learning, immersion experiences and collaboration. |

Source: Gartner (July 2019)
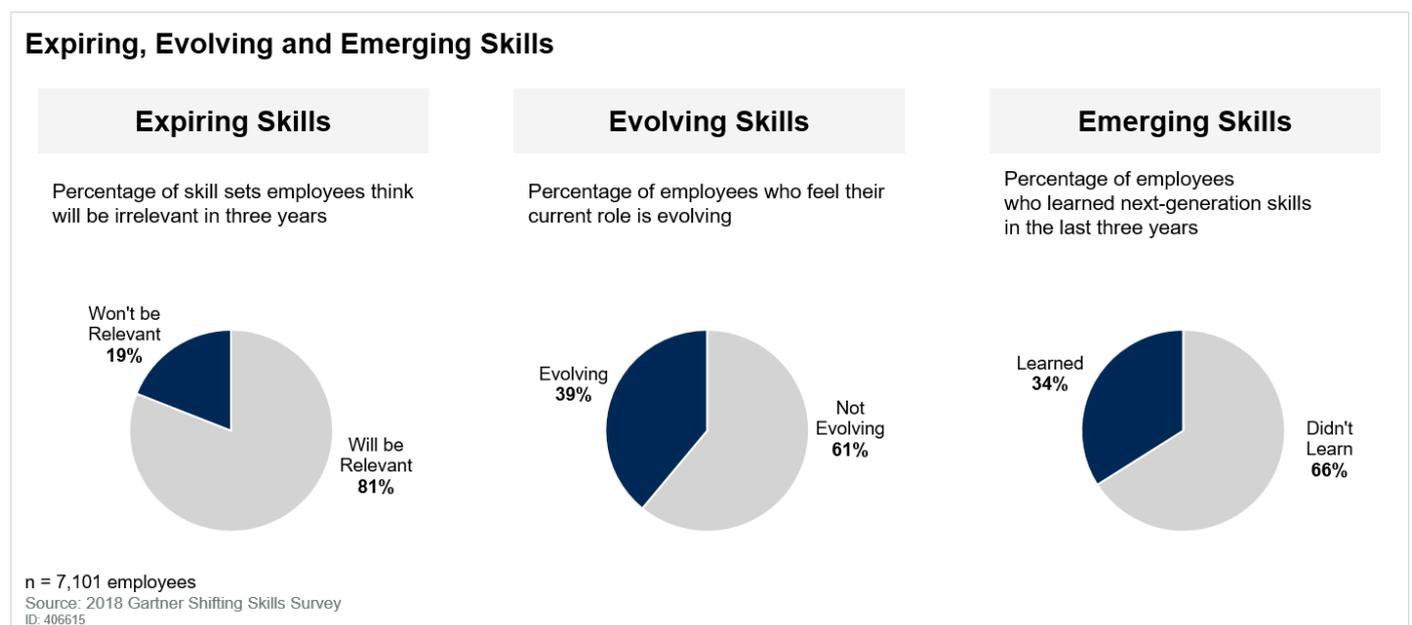ID: 431329

## Impacts and Recommendations

### Radical Changes in the Next Three to Five Years Will Require Innovative Methods to Manage Skills

The pace of change in business models is increasing as the impacts of digital business sweep through organizations of all industries. This is resulting in old skills and functions of I&O organizations no longer being enough, and entirely new types of skills are required (see Figure 2).

A Gartner survey in the first quarter of 2018 determined that the rate of change within the business is dramatically changing the skills necessary to remain competitive. IT and business executives agreed that now, and in the future, the skills and knowledge in the organization will have little resemblance to the what they have today. The survey revealed broad consensus in predicting major changes in skill requirements.

This survey was not specific to I&O, where even more change is likely to occur over this time frame. This divergence from current skill needs will be continuous, but will also occur in waves that are triggered by technology innovation, evolving business dynamics and senior management's willingness to embrace agility. I&O leaders will see that many specific "legacy" technical skills, such as operating systems and IT operations management tools, have already morphed significantly. Other I&O technologies (such as cloud, containers, IoT, monitoring, machine learning and analytics) continue to rapidly evolve, making environments anything but steady. This pace has been increasing and is unlikely to slow down.

Figure 2. Expiring, Evolving and Emerging Skills



**Expiring, Evolving and Emerging Skills**

**Expiring Skills**
Percentage of skill sets employees think will be irrelevant in three years

Won't be Relevant **19%**
Will be Relevant **81%**

**Evolving Skills**
Percentage of employees who feel their current role is evolving

Evolving **39%**
Not Evolving **61%**

**Emerging Skills**
Percentage of employees who learned next-generation skills in the last three years

Learned **34%**
Didn't Learn **66%**

n = 7,101 employees
Source: 2018 Gartner Shifting Skills Survey
ID: 406615

Dealing with constant business and infrastructure churn requires the right skills and people. I&O leaders must take on the development of an effective skills portfolio as a strategic imperative. It takes time to reskill an entire workforce, and it is very disruptive to replace one. Striving to look farther in to the future in terms of what types of new skills will be needed will help provide more of a runway to adapt in time.

Recommendations:

■ Leverage self-assessment and benchmarking tools (such as the Gartner IT Score) to establish baselines and determine areas of I&O strengths and weakness that can be parlayed into identifying immediate and future required skills.

- Select a senior individual who is passionate about the topic to take the point position in leading the implementation efforts as the first step in demonstrating the importance of skills transformation.

- Invest resources in a formal skills transformation program that develops initial assumptions about how skill requirements will impact your organization over a three- to five-year time frame, starting with digital business stressors already impacting I&O.

- Actively explore emerging skills that promote digital dexterity, problem solving and collaboration as an alternative to more traditional and structured forms of learning.

## Digital Business Megatrends Will Alter the Types and Quantities of Skills Required

The next wave of change impacting I&O has been associated with cloud-based technologies, such as infrastructure as a service (IaaS), and with the need to respond to major changes in application development methods and tools. Many application development groups have at least partially embraced agile methods, with many having that as the predominant platform for new development (see "Implementing Enterprise Agile Using the Scaled Agile Framework [SAFe]"). This has required I&O to embrace DevOps to sync up with their development partners and avoid a speed mismatch between the rate of deployment requirements with the traditional capabilities of I&O.

Coming on the heels of the still-occurring wave of cloud, agile and DevOps, we see the implications of digital business introducing a much more dynamic business environment frequently using cloud-based services (see "How to Build Digital Business Excellence by Reinventing I&O"). Enterprises are choosing to offer new types of services and experiment more rapidly with more tolerance for risk in order to capture a competitive advantage.

Digital business embraces the use of IoT, which will introduce orders of magnitude. These IoT devices will require more management services than are available today. Gartner's market forecast is that, by 2021, the world will be acquiring more than $500 billion in IoT services (see "Forecast Analysis: Internet of Things — Services, Worldwide, 2017 Update").

Collectively, the above disruptive changes reduce, eliminate and change the need for many I&O skills required in the past to such a degree that many current staff members' entire job focus will be altered. For example, routine systems maintenance tasks may be eliminated in an IaaS model, along with skills for managing hardware in an on-premises data center. Embracing immutable infrastructure obviates the need for much of traditional patching tools and skills. Instead, higher-level skills, such as architecture and design work, to define and manage automation and orchestration are needed.

The total head count requirements for I&O are likely to remain unchanged, but will require an increase in the percentage of highly skilled and compensated employees. Smaller and midsize organizations may select to rely more on managed service providers or outsourcers if they can't justify the investment in attracting, training and retaining the skills needed in this new environment.

Other categories of change (such as analytics, machine learning, edge computing and advanced automation) will be coming over the next two to 10 years, adding to the skills deficit. I&O leaders approaching the deluge of change using the same skills management will fail. A more holistic redefinition of what skills are required for I&O needs to be top priority.

In addition to providing internal development opportunities (such as dojos, hackathons, guilds, COEs and mentoring), including rotations and special assignments, it will be necessary to acquire skills via external hiring to keep pace with the changes. I&O must proactively position and market itself as a desirable place to work that affords opportunities to develop new skills (see "Rebalancing the IT Skills Portfolio: Increasing Versatility to Enable Dynamic Change"). Building a skills development competence into the culture is essential to inspire current staff members to identify ideal candidates from within their social networks to target for hiring.

Recommendations:

- Provide internal development opportunities for potential staff, including rotations and special assignments, moving people around I&O as well as to application teams and, potentially, the business groups, to keep pace with the changes.

- Implement a prioritized set of methods to change the skills portfolio of the I&O organization, such as a periodic skills gap analysis comparing current and future skill needs and revising training policies to ensure they focus more on leading-edge skills.

- Apply metrics that track the usage and demand for individual skills as well as more qualitative feedback to ensure material progress is being achieved at an appropriate pace.

- Devote at least 25% of the training and development budgets to skills beyond current needs, such as cognitive innovation skills, to prepare for the future.

- Modify traditional recruiting strategies to target specific emerging competencies and skills and partner with HR to ensure new and more creative methods of identifying and attracting candidates to supplement the internal development of staff (see "Attract and Recruit Top Talent With a Compelling Employment Value Proposition").

## The Changes in Essential Skills Will Require I&O Leaders to Adopt More Radical Methods of Growing Skills

Insight gained via client inquires indicates that the typical skills development orientation in an I&O organization has been reactive in nature. When a new technology appears in the market and a justification is there to use it, training or other methods are utilized to develop the skills needed. Often, Gartner observes clients don't invest in developing the skills until after they are needed, resulting in instability during the early life cycle of new technologies.

Formal training based on continuous learning still has a useful role to play, when it is targeted appropriately at developing specific skills and knowledge that is required considering the I&O

organization's maturity.

However, taking a more holistic approach to developing and acquiring talent and skills is needed to keep up with the variety of needs and the pace of change. Encouraging "connected learning" for their people is a more effective way for I&O leaders to create the necessary skills (see "Transforming IT Staff for a Digital Business: A Blueprint for Connected Learning"). Connected learning involves skill building based on individual learning needs and careers. Gartner survey data indicates that connected learning has real impact, as connected learners tend to be high-performance employees who achieve high degrees of success. Connected learners:

- Learn skills 25% faster

- Are 66% more engaged in their work

- Are 4.2 times more likely to stay with the current employer

- Are eight times more likely to be high performers

Connected learning involves having a trifecta of affiliations aligned to market conditions, organizational needs and ongoing individual developmental needs. Understanding large and sweeping megamarket trends affords staff the ability to grasp and apply big-picture requirements.

Aligning to organizational needs empowers users to understand "the why" of their efforts, as the dynamic nature of business can create frustrating scenarios for I&O efforts.

Furthering the knowledge of the individual is jointly defined by management and the employee. Collaboratively agreeing on skills training creates incentives that promote constant learning and exposure to the ever-changing landscape of I&O.

A foundational strategy that is often overlooked is aggressively decommissioning skills that will be less important in the future. Every I&O leader is faced with a resource-constrained environment where there is never enough money, time or people to address all of the challenges. This means shifting people off of current roles supporting technologies that should be sunset.

Leadership should take care to not prematurely eliminate all support, but also recognize there is overhead in maintaining skills and knowledge in any given technology or operational area. For example, maintaining support for several varieties of legacy UNIX server environments spread across many system administrators is a burden. If time is needed to develop skills in supporting newer and more strategic platforms (such as hyperconverged systems or cloud-based container management solutions), then invest in reducing the staff devoted to those legacy environments. Or, better yet, include the benefits of reduced skill requirements in a business case to retire a platform from production use.
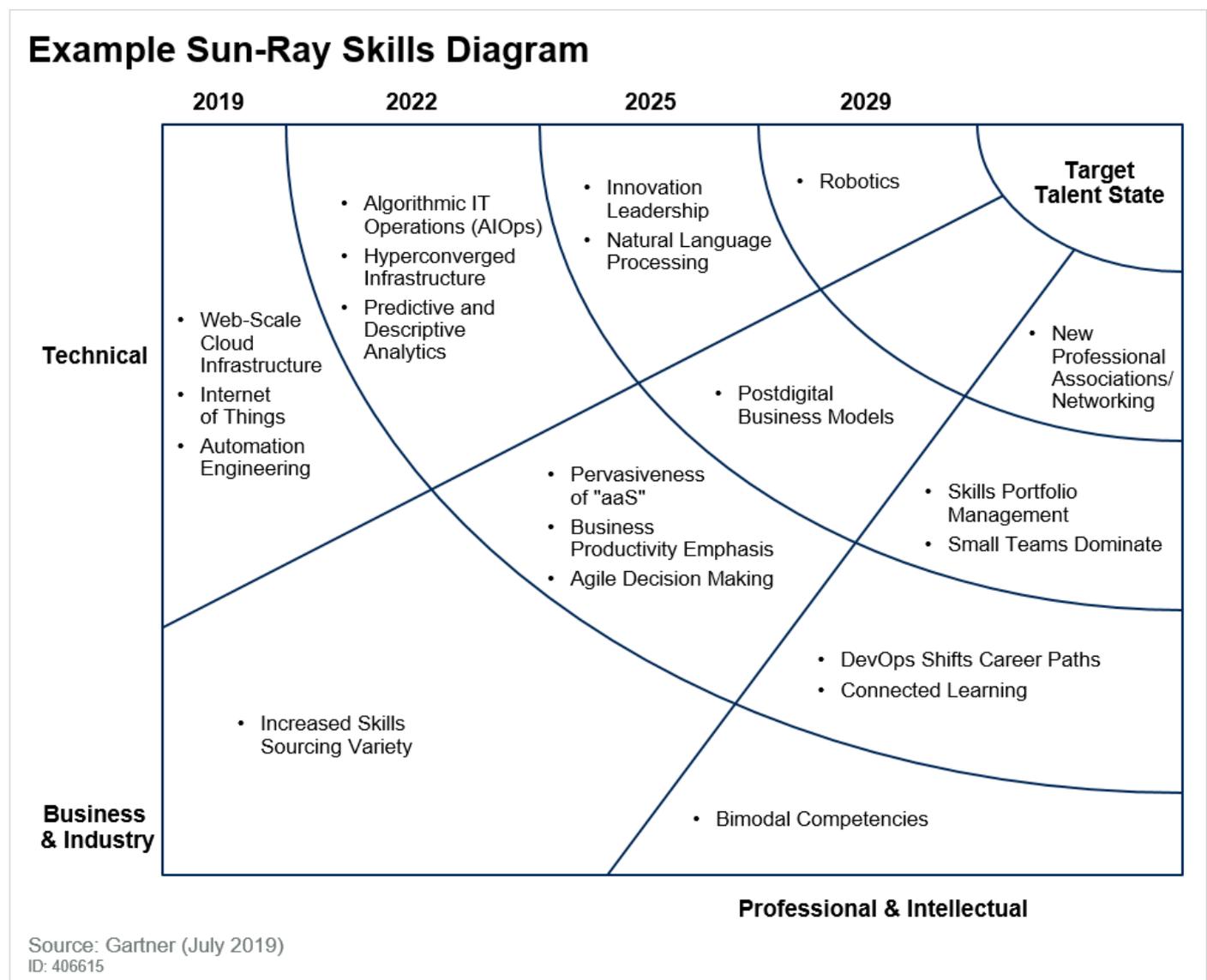
Further, a regular cadence should be established to review skills requirements. An extensive review should be conducted on an annual basis that includes doing research and questioning prior

assumptions. A quarterly update cycle will allow for any course corrections required since the last annual review. The I&O senior leadership team and the CIO should be the primary participants.

A spreadsheet-based skills-tracking tool can help understand the inventory of current skills at different proficiency levels. Consider experimenting with visual methods of depicting emerging skill needs over different timeframes. Figure 3 shows an example format using a sun-ray chart to quickly visualize key factors that will influence skill needs broken down in several categories, with three-year increments for the coming decade.

Some specific items are included to demonstrate how this could be used, but each organization could customize it to include the data and scenarios that they found most important. This single chart can stimulate discussion and get the leadership team thinking about what investments need to be made to develop skills over time using a portfolio approach.

**Figure 3. Example Sun-Ray Skills Diagram**



**Example Sun-Ray Skills Diagram**

2019   2022   2025   2029

- Innovation Leadership
- Robotics
- Natural Language Processing

**Target Talent State**

**Technical**

- Algorithmic IT Operations (AIOps)
- Hyperconverged Infrastructure
- Predictive and Descriptive Analytics

- Web-Scale Cloud Infrastructure
- Internet of Things
- Automation Engineering

- Postdigital Business Models

- New Professional Associations/ Networking

- Pervasiveness of "aaS"
- Business Productivity Emphasis
- Agile Decision Making

- Skills Portfolio Management
- Small Teams Dominate

- DevOps Shifts Career Paths
- Connected Learning

- Increased Skills Sourcing Variety

**Business & Industry**

- Bimodal Competencies

**Professional & Intellectual**

Source: Gartner (July 2019)
ID: 406615

Recommendations:

- Actively accelerate the decommissioning of skills that will be of less value in the future, such as repetitive and manually intensive activities like patching and support for proprietary platforms that should be retired.

- Establish a quarterly review process to identify changes in demand for existing skills, the need to track new skills and progress on efforts to reduce gaps in needed skills.

- Create visual methods of depicting emerging skills to more easily see big-picture issues and patterns as a supplement to traditional, detailed skills spreadsheets.

## Evidence

The results presented from the Gartner 2018 Shifting Skills Survey are based on a Gartner study conducted in 1Q18 to examine how employee skills are changing in mainstream organizations. The research was conducted via an online survey in North America, Western Europe and Asia/Pacific in midsize and large organizations. Participants were screened for their organizations' performance and approach to innovation. Respondents were required to have involvement in decisions pertaining to organizations' business strategies.

We also used insight gained from over 100 client inquiries with I&O leaders regarding skills between July 2018 and May 2019.

## Document Revision History

Transform I&O Skills to Remain Viable - 4 October 2016

## Recommended by the Author

Assess Your IT Bench Strength for Digital Business Transformation

How to Develop an IT Strategic Workforce Plan

Using a Digital Talent Management Framework to Build a Digital-Ready Workforce

Leadership Vision for 2019: Infrastructure and Operations Leader

Understanding the Transformational Impact of Digital Business on the I&O Organization

Overview of How to Plan, Recruit, Develop and Retain a Skilled IT Workforce

Ten Absolute Truths About Talent Management in Digital Business

## Recommended For You

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