

NICE Webinar Series

NATIONAL INITIATIVE FOR **CYBERSECURITY** EDUCATION



Competencies – The Next Frontier for Closing the Cybersecurity Skills Gap
December 16, 2020

NICE

NATIONAL INITIATIVE FOR **CYBERSECURITY** EDUCATION



Competencies in the Revised Workforce Framework for Cybersecurity (NICE Framework)

Karen A. Wetzel, Manager of the NICE Framework

karen.wetzel@nist.gov

Why a Workforce Framework for Cybersecurity?

A consistent framework model...



EMPLOYERS



LEARNERS



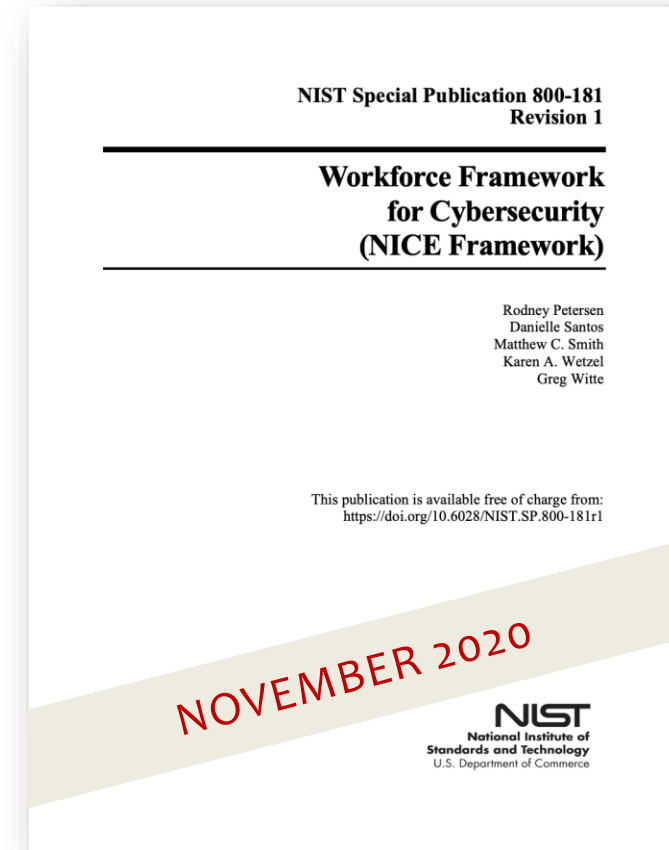
EDUCATION, TRAINING, &
CREDENTIAL PROVIDERS

- Enables the establishment of **regular processes** – from hiring to training and assessment – for multiple roles in an organization.
- Shares **clear information about cybersecurity work** to help students interested in this career field, people looking for a new job or to change job roles, and workers who are looking to demonstrate or increase their competencies.
- Provides direct information about **what a workforce needs to know**, helping in the development of certificates, badging, and other verification techniques to consistently describe learner capabilities

NICE Framework Revision

Revision Changes

- Introduction of Competencies
- Removed:
 - Specialty Areas (reflected in Competencies, Roles)
 - Ability Statements (incorporated in Skill statements)
- Appendices: Moved outside the publication



nist.gov/nice/framework

NICE Framework Attributes

- Agility
- Flexibility
- Interoperability
- Modularity



Why Competencies?

Executive Order on
Modernizing and Reforming
the Assessment and Hiring of
Federal Job Candidates
(June 2020)

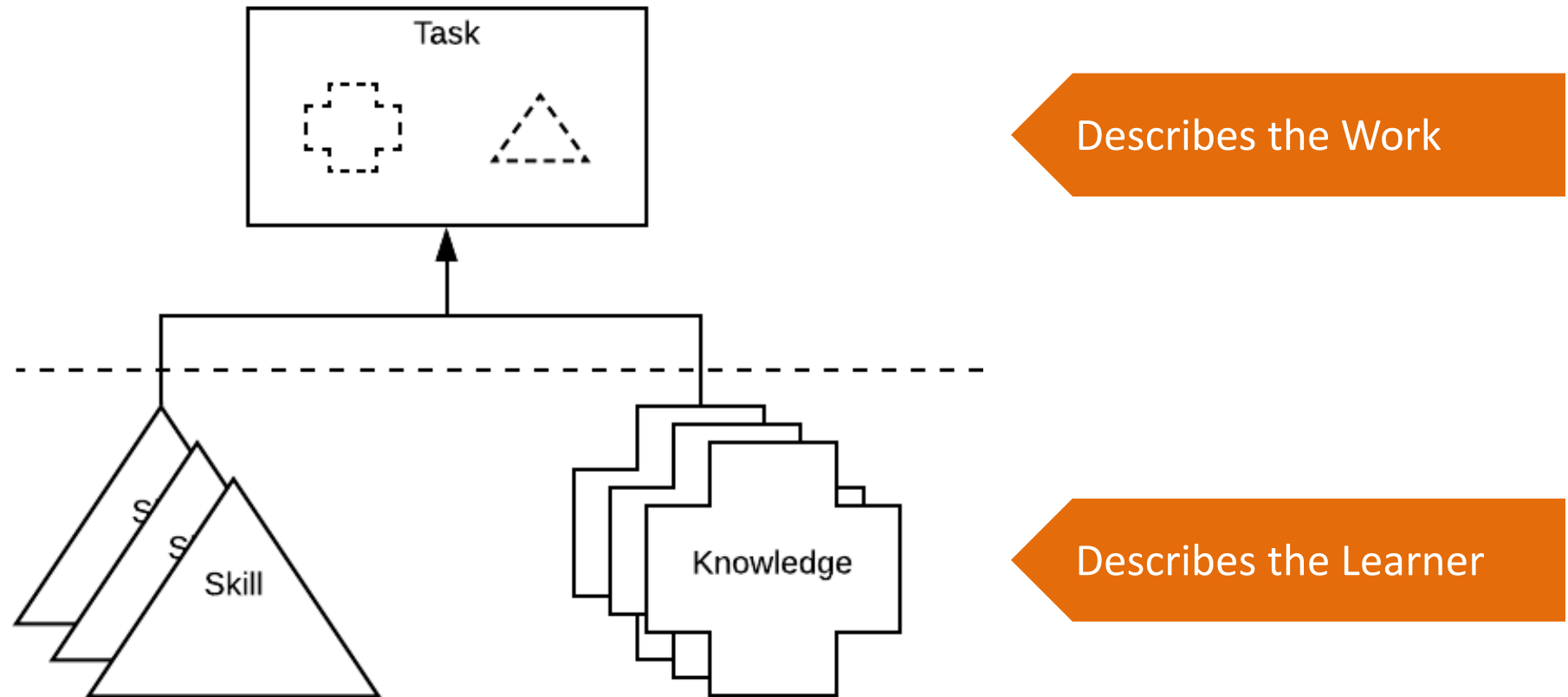
<https://www.whitehouse.gov/presidential-actions/executive-order-modernizing-reforming-assessment-hiring-federal-job-candidates/>

America's *private employers have modernized their recruitment practices* to better identify and secure talent through skills- and competency-based hiring.

...

Modernizing our country's processes for identifying and hiring talent will provide America a *more inclusive and demand-driven* labor force ... ensuring that the individuals *most capable of performing the roles and responsibilities* required of a specific position are those hired for that position.

Building Blocks: Tasks, Knowledge, and Skills (TKS)



Applications and Uses



What is a Competency?

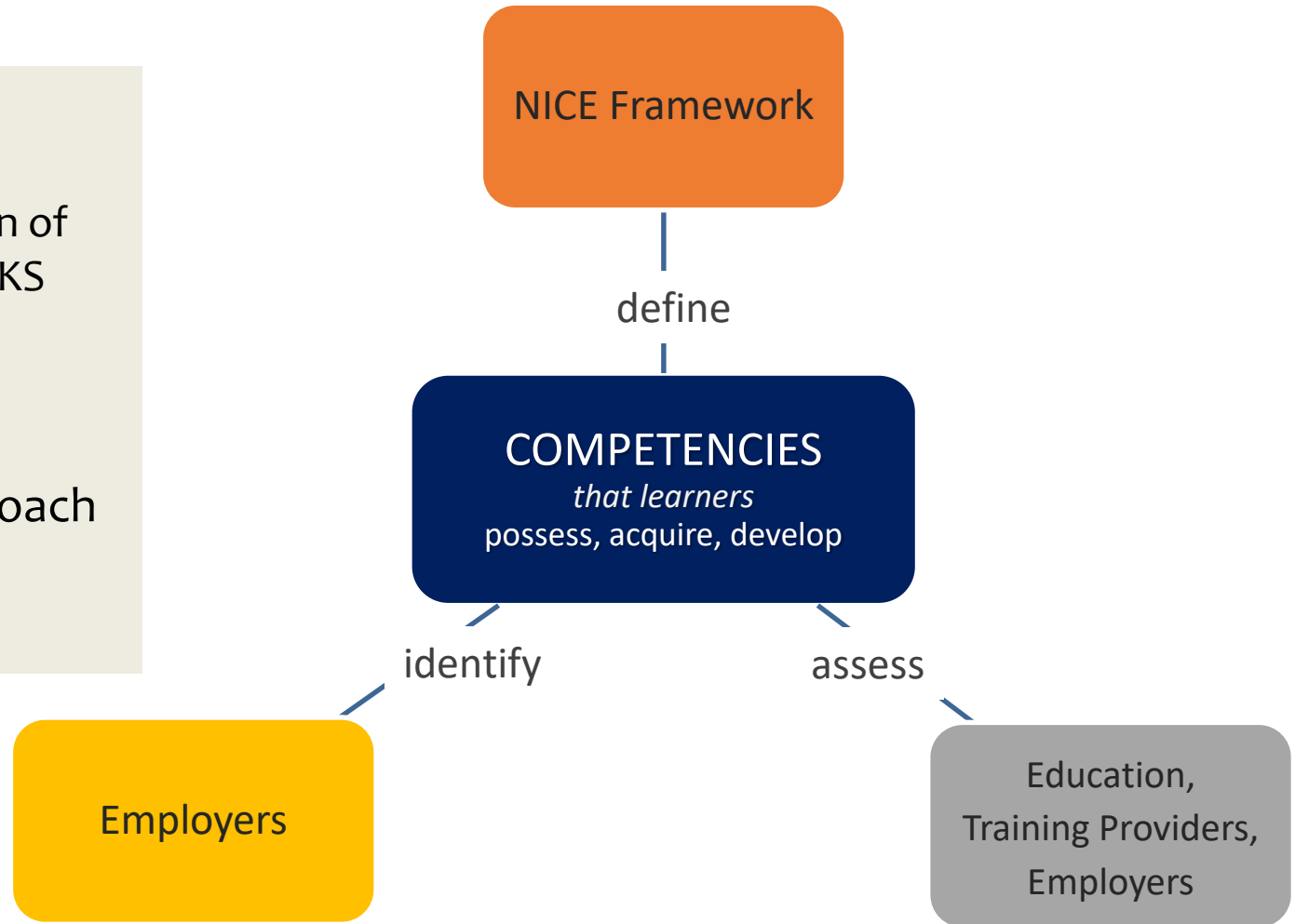
What are Competencies?

Competency: A mechanism for organizations to assess learners.

Competencies consist of a name, description of the Competency, and group of associated TKS (Task, Knowledge, Skill) statements.

Competencies are

- Defined via an employer-driven approach
- Learner-focused
- Observable and measurable

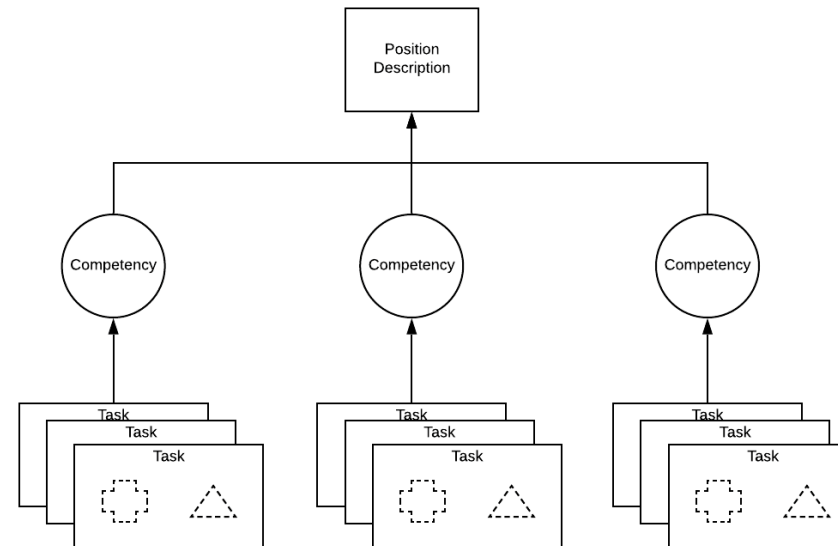


But how can I use them?

- **Employers**
 - Describe needed expertise within a given position
 - Track workforce capabilities
 - Specify team requirements
 - Assess learner capabilities

Assessment examples:

- Interview
- Pre-employment testing
- Work-based learning observation
- Lab-based demonstration
- Oral evaluation



Ex.: Using Competencies to Assess Learners through a Position Description

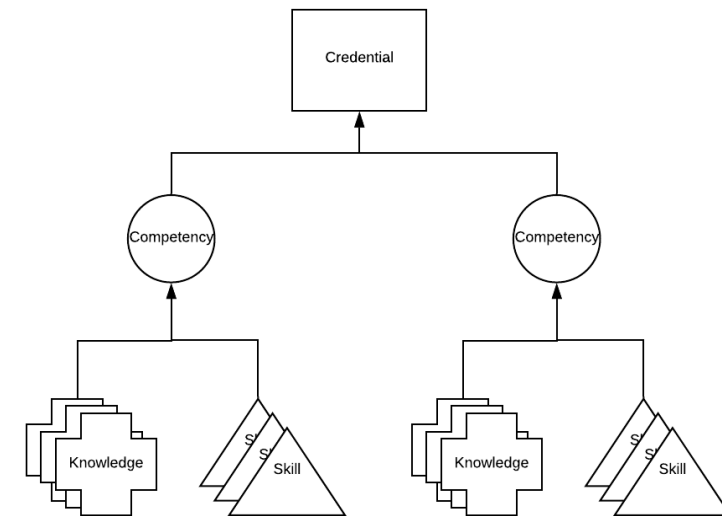
But how can I use them?

- **Education/Training Providers**

- Instructors might look at the most frequent K&S reflected in a competency to focus on teaching those
- Providers might use tasks in a competency to test whether learners have achieved the K&S in that area
- Providers might use a set of competencies to develop a learning program

Can be applied in parts or as a whole

- Knowledge & Skills
- Tasks
- Competency
- Multiple Competencies



Ex.: Using Competencies to Assess Learners through a Credential

But how can I use them?

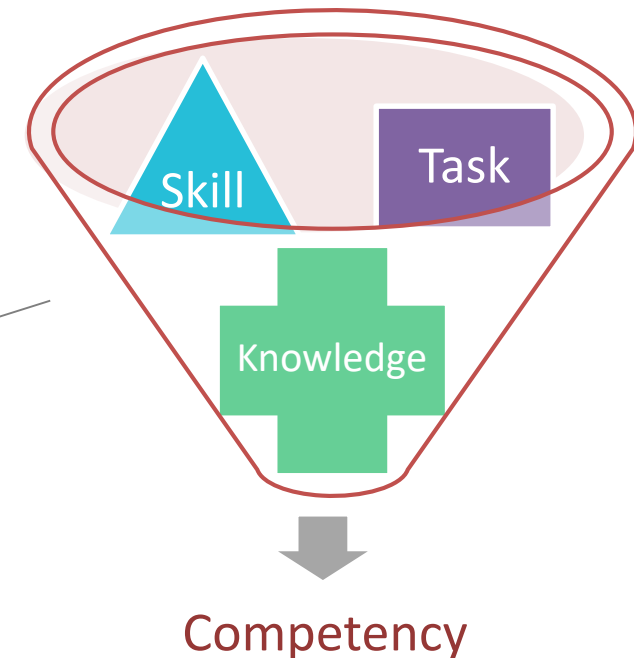
- **Learners**

- To assess one's abilities
- To identify areas that may need development
- To learn about a defined area of expertise
- To understand an organization's workforce needs

At multiple stages:

- Initial Interest
- Students
- Job-seekers
- Career Development

Ex.: Assessing
One's Abilities



Next Steps

- **2021 Change Plan**

Review and updates to align with revision; for final release November 2021

- Competencies (including Specialty Areas) – *expected January 2021*
- Work Roles (including Specialty Areas)
- Skill Statements (including Ability Statements)
- Knowledge Statements
- Task Statements
- Categories

- **2021-2022: Ongoing Change Process**

- Additions, adjustments
- Earlier content will still be available
- New supporting resources



December 2020/
January 2021
Launch of NICE
Framework
Users Group

THANK YOU!

NICE Framework Resource Center

nist.gov/nice/framework

NICE Framework Publication

Revised, streamlined document

NICE Framework Data

Tasks, Knowledge, Skills, and Work Roles (formerly appendices) continue to be available at the NICE Framework Resource Center; Competencies to join soon.

Karen Wetzel

Manager of the NICE Framework

karen.wetzel@nist.gov

NICEFramework@nist.gov

Q & A

USING COMPETENCY-BASED APPROACHES TO CLOSE THE CYBERSECURITY SKILLS GAP

Competency Defined



Skills &
Abilities

Application
& Transfer

What do I
need to *know*?
What theories
or ideas?

What do I
need to be
able to *do*?

What
dispositions
must I display?

Where must I be
able to apply
these KSAs, and at
what level?

Understands the theory of XXX, and has the skills and dispositions to successfully apply all of these at the *beginning* level in XXX situation.

Focus on what's needed to be successful - outcomes.

What is CBE?

- Competency-based education (CBE) is focused on **actual student learning**, and the **application** of that learning, rather than time spent in class/on material.
- Learners' **progress is measured** when they **demonstrate** their competence through a **system of rigorous assessments**, meaning they **prove** they have **mastered** the knowledge and skills, **required** for a particular **competency** or area of study.

Competency-Based Approaches

Competency-Based Learning

- Courses or modules offered by IHEs
- Prior Learning Assessment
- Military credit
- Other work-based learning
- Apprenticeships
- Industry certifications
- Government licensures

Competency-Based Education

- Direct assessment credential programs
- Course-based, credit-hour CBE credential programs

Quality Framework for Competency- Based Education Programs

Released September 2017

Quality Framework for Competency-Based Education Programs

Eight Elements of Quality

-  **1** Demonstrated Institutional Commitment to and Capacity for CBE Innovation
-  **2** Clear, Measurable, Meaningful and Integrated Competencies
-  **3** Coherent Program and Curriculum Design
-  **4** Credential-level Assessment Strategy with Robust Implementation
-  **5** Intentionally Designed and Engaged Learner Experience
-  **6** Collaborative Engagement with External Partners
-  **7** Transparency of Student Learning
-  **8** Evidence-driven Continuous Improvement

C-BEN's Priorities and Work



**Grow
Demand**



**Build
Capacity**



**Remove
Barriers**

Dr. Charla Long
Executive Director
Competency-Based Education Network
charla@c-ben.org
615-517-1256
Website: www.cbenetwork.org

Q & A

Building a Dynamic Skills Organisation

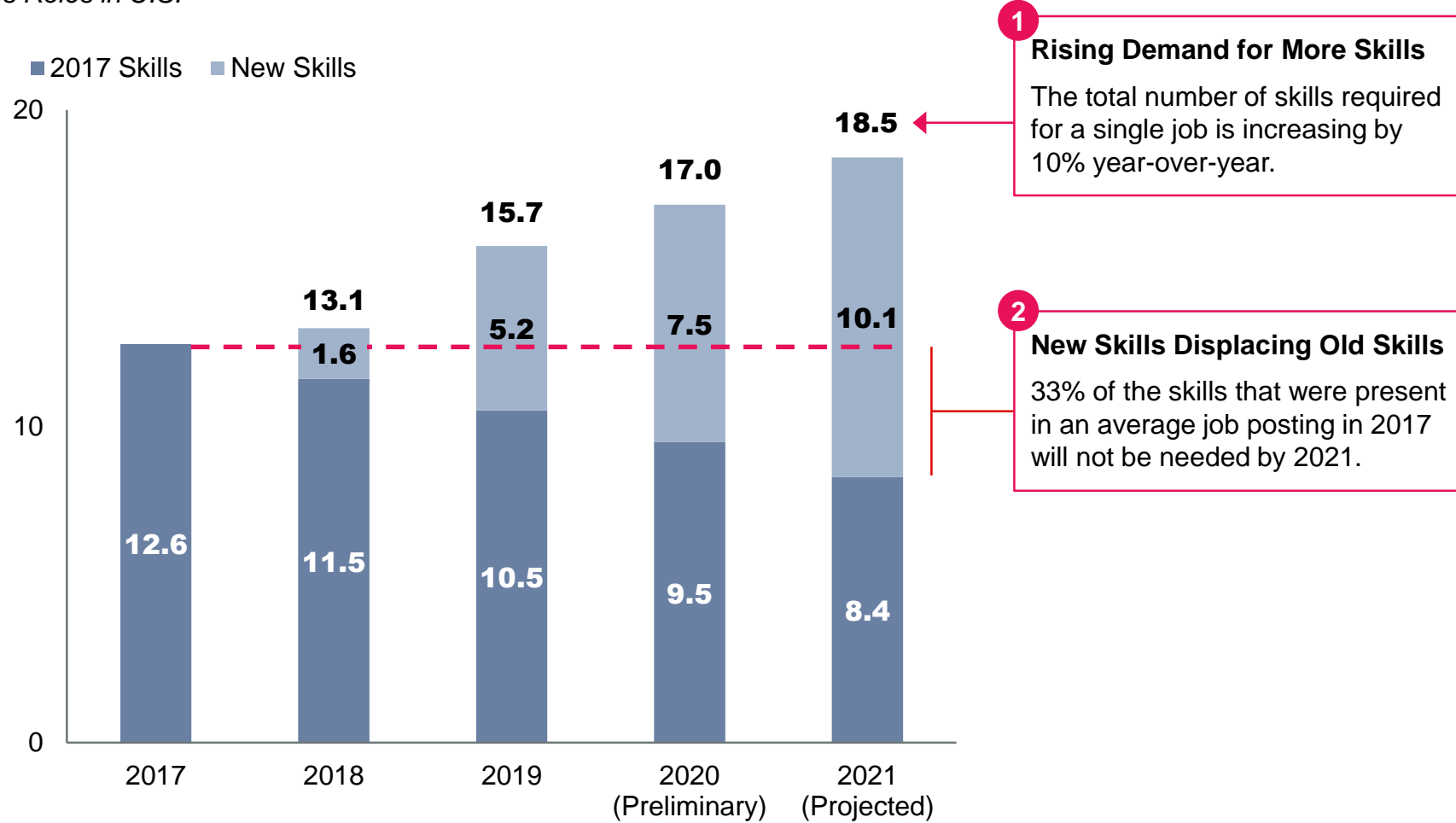
Brian Kropp
**Vice President and Chief of Human
Resource Research**

16th December 2020

Gartner®

One-Two Punch: More Skills and New Skills

Average Skills Required per Job Posting
IT, Finance and Sales Roles in U.S.

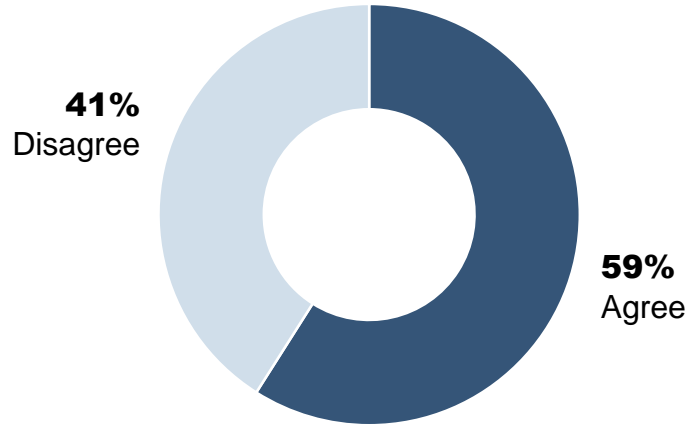


n = 13,166,410 (2019); 12,008,840 (2018); 9,991,265 (2017) job postings
Source: Gartner TalentNeuron

HR Reacting to Skill Changes

Q: “We Are Constantly Trying to Keep Up With the Learning Requests of the Business.”

Percentage of HR Executives

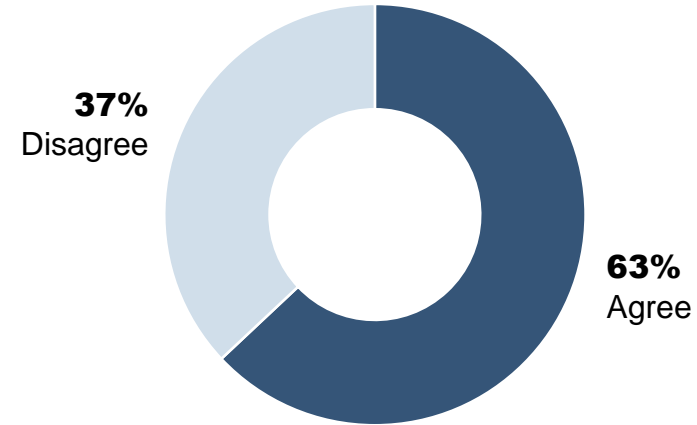


n = 75 HR executives

Source: 2020 Gartner Shifting Skills Survey for HR Executives

Q: “Our HR Function Addresses Skill Needs When Asked by the Business.”

Percentage of HR Executives



n = 75 HR executives

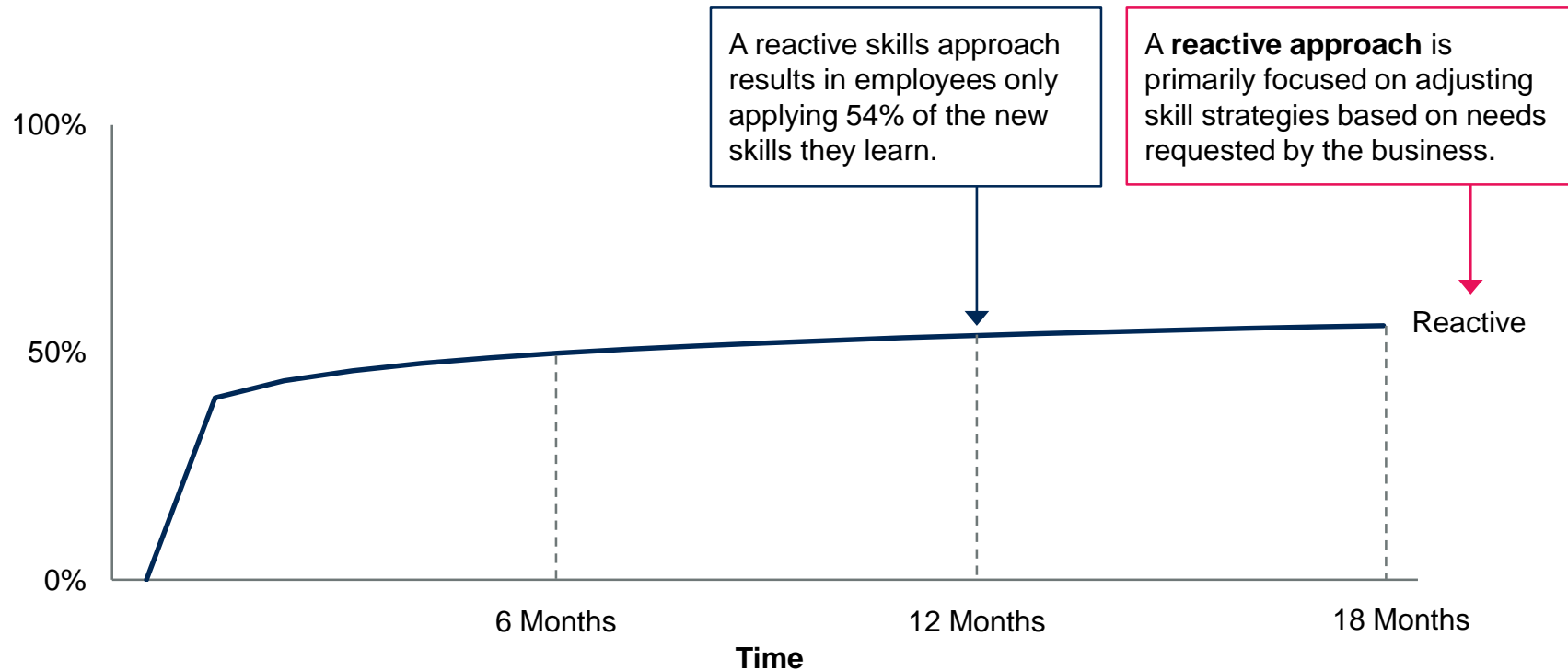
Source: 2020 Gartner Shifting Skills Survey for HR Executives

“There are many more requests for learning, and we don’t have the resources or staff to address them all. ... and **when we put together a learning solution, the business has already moved on.**”

Head of Learning and Development, Manufacturing Organization

Reactive Approach Fails to Keep Up

New Skills Applied Over Time, by Skill Approach
Average Percentage of New Skills Applied

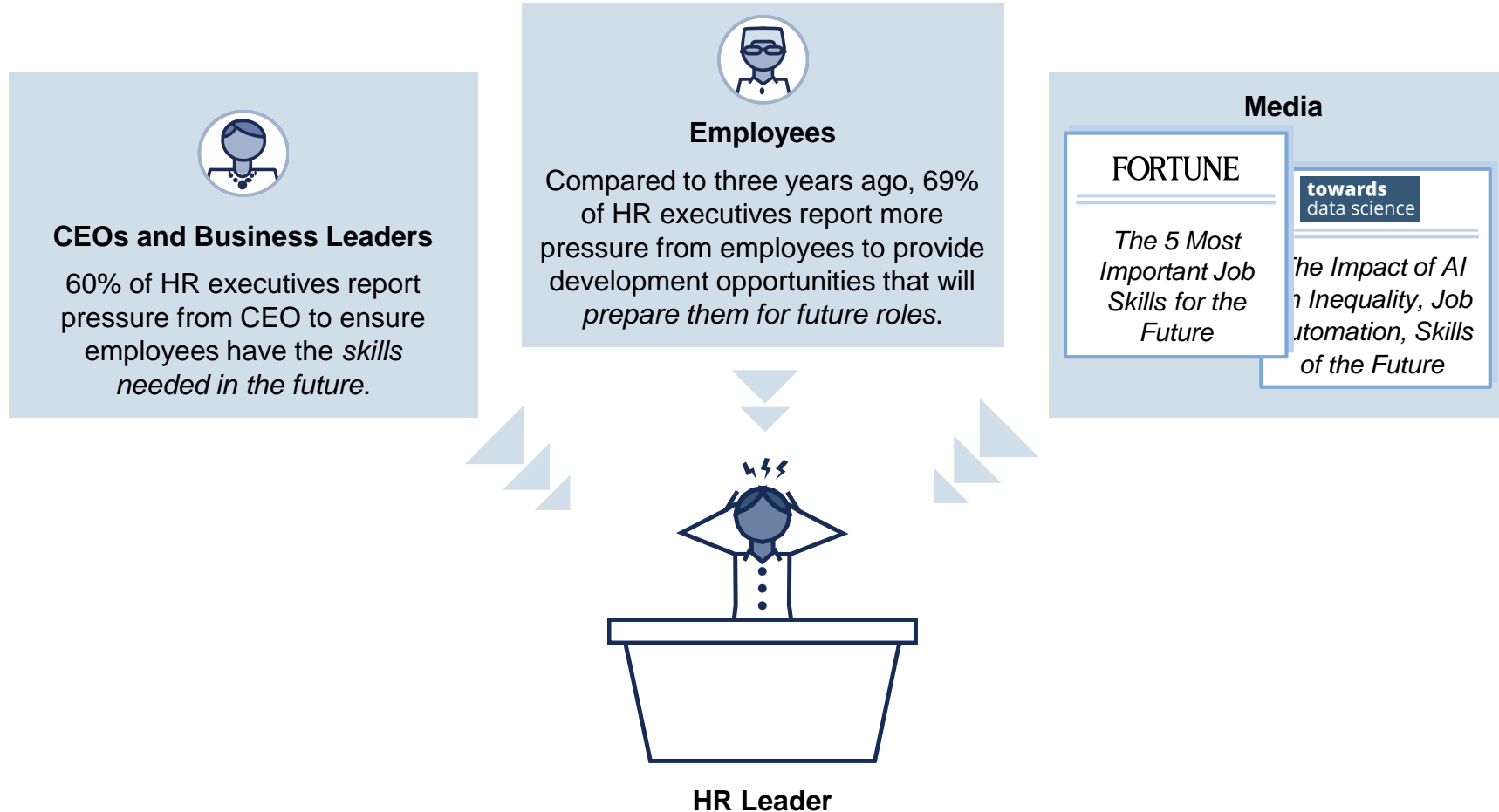


n = 6,510 employees; 75 HR executives; 35,166,515 job postings for IT, Finance and Sales in U.S.
Source: 2020 Shifting Skills Survey for Employees; 2020 Shifting Skills Survey for HR Executives; Gartner TalentNeuron

New Skills Applied measures the percentage of new skills employees learn and apply on the job.

Pressure on HR to Get Ahead of Skill Needs

Demands From All Directions to Identify the “Skills of the Future”



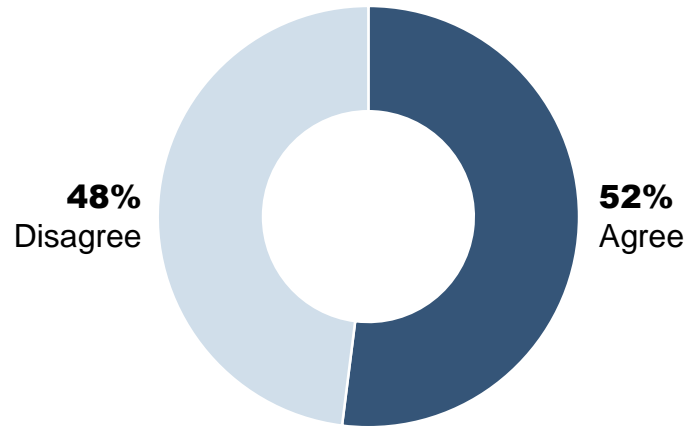
n = 75 HR executives

Source: 2020 Gartner Shifting Skills Survey for HR Executives; [“The 5 Most Important Job Skills For The Future,”](#) Forbes; [“The Impact of AI on Inequality, Job Automation, and Skills of the Future,”](#) Toward Data Science.

Our Strategy: Predicting Skill Shifts

Q: "My Organization Prioritizes Identifying Skills That We Anticipate Needing in the Future."

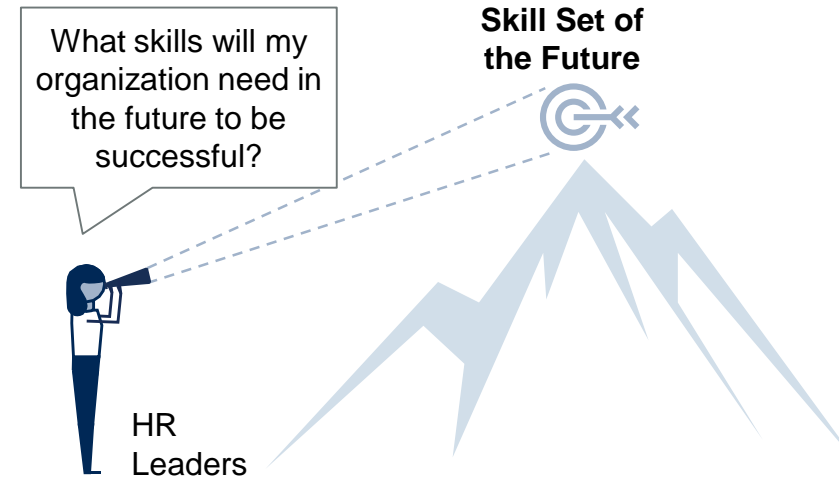
Percentage of HR Executives



n = 75 HR executives

Source: 2020 Gartner Shifting Skills Survey for HR Executives

Common Focus: Identify Required Future Skills



Source: Gartner

Components of a Predictive Approach



Focus on identifying a fixed set of future skills.



Target investments at preemptive development programs.



Inspire employees to adopt a learning mindset.

Source: Gartner

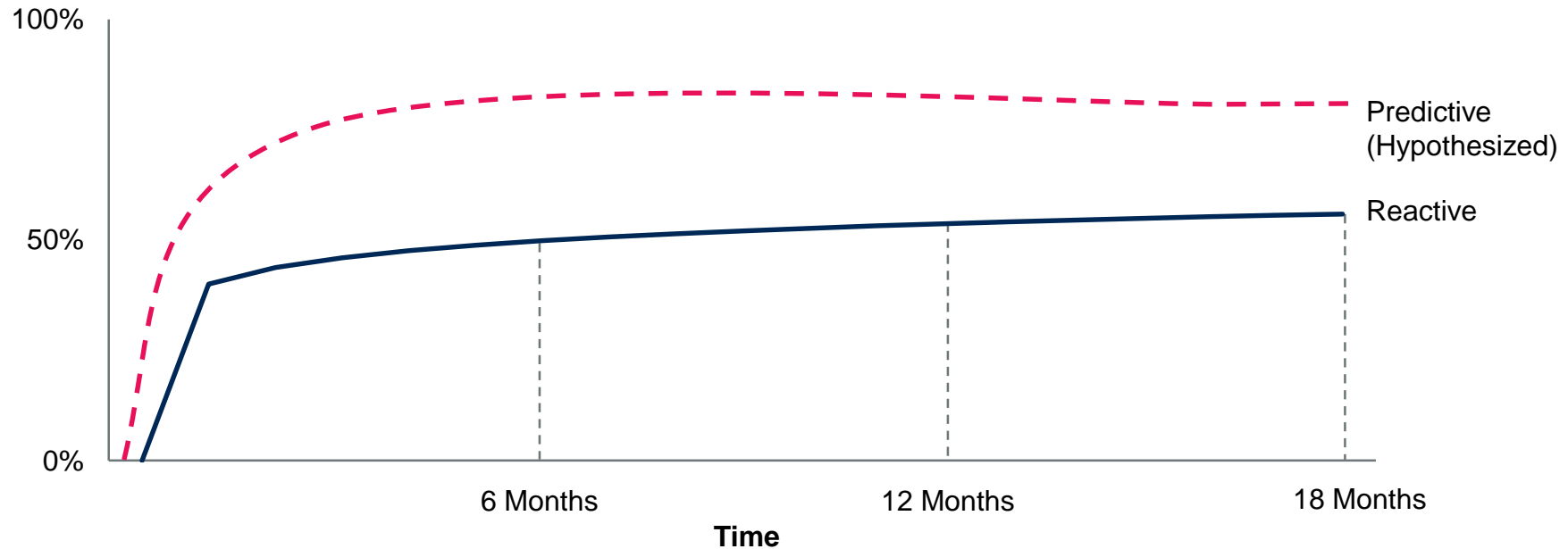
Goal: Preempt Fast Shifts With Predictive

New Skills Applied Over Time, by Skill Approach

Average Percentage of New Skills Applied



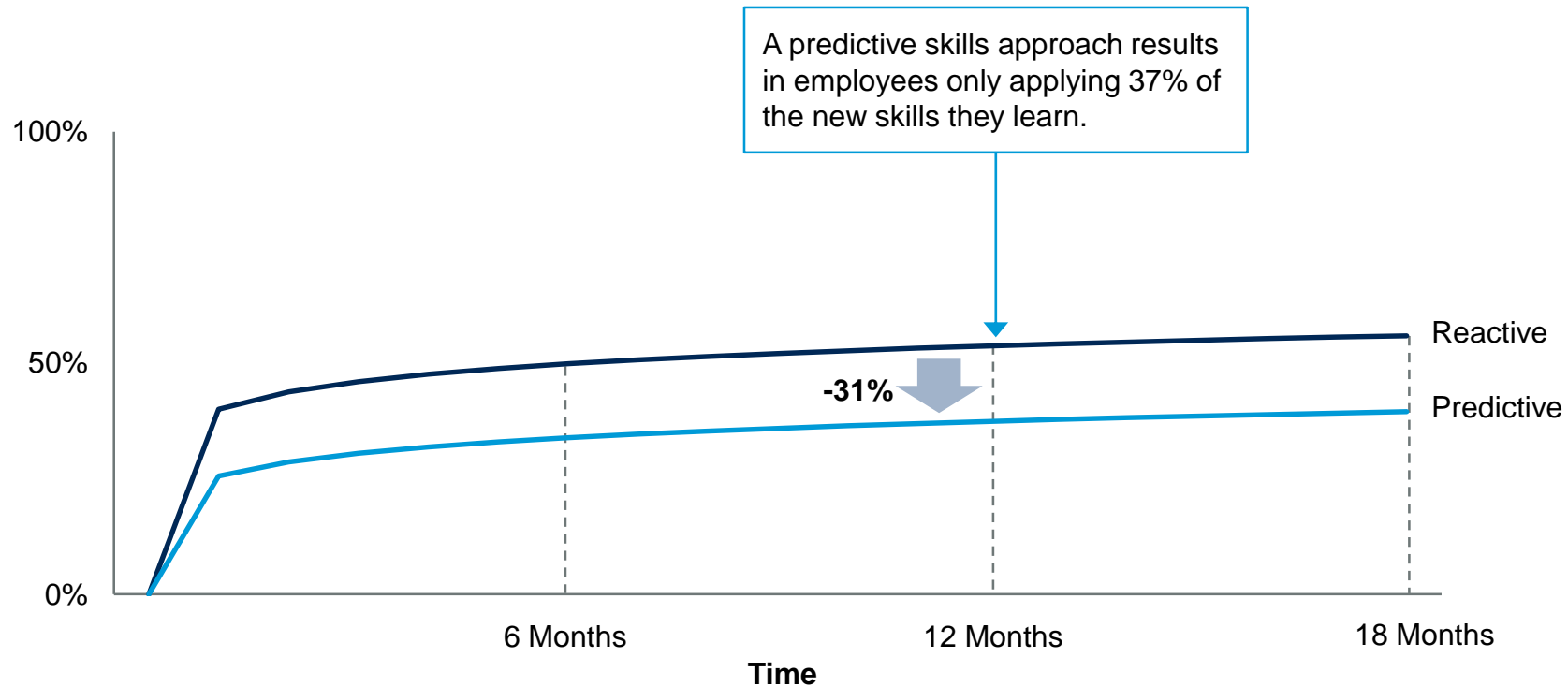
Hypothesis: A predictive approach will increase the percentage of skills employees learn and apply on the job.



n = 6,510 employees; 75 HR executives; 35,166,515 job postings for IT, Finance and Sales in U.S.
Source: 2020 Shifting Skills Survey for Employees; 2020 Shifting Skills Survey for HR Executives; Gartner TalentNeuron

Predictive Approach Is Worse Than Reactive

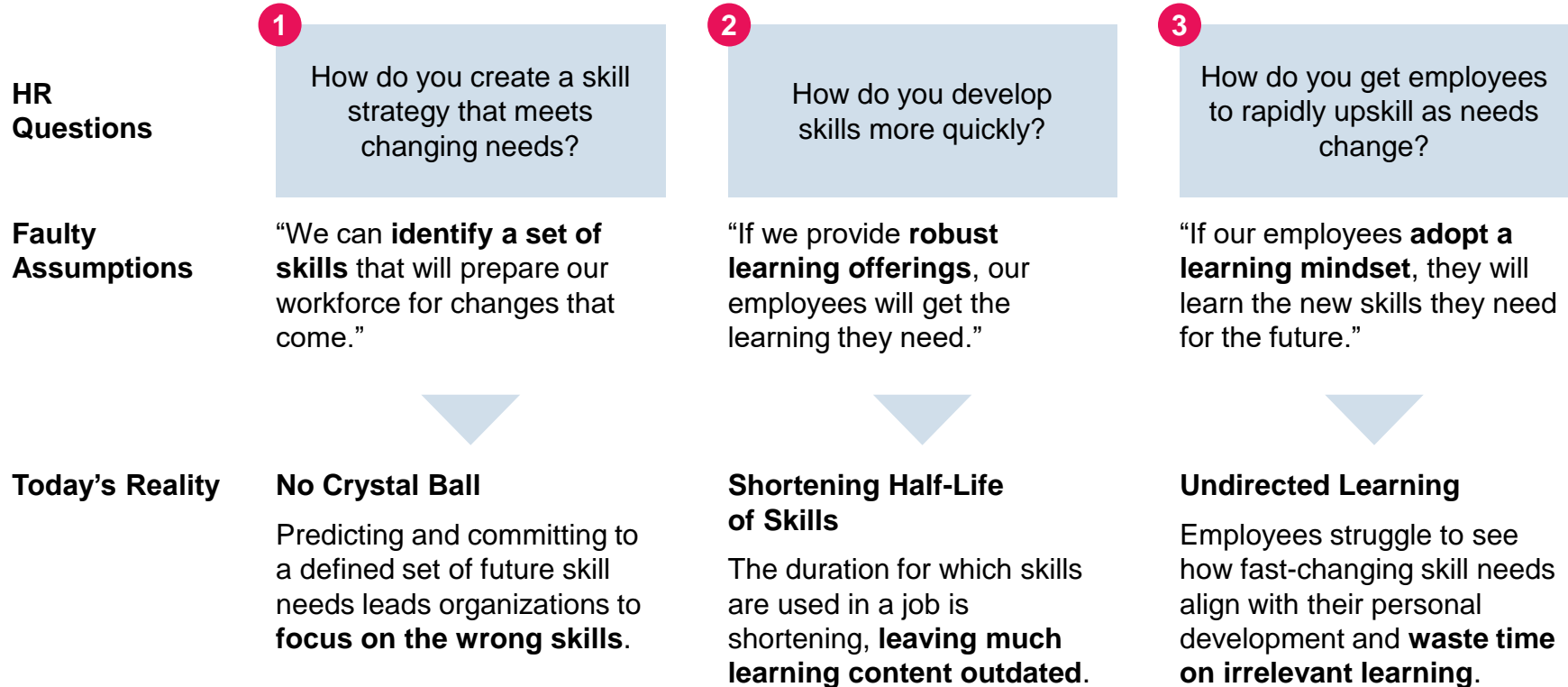
New Skills Applied Over Time, by Skill Approach
Average Percentage of New Skills Applied



n = 6,510 employees; 75 HR executives; 35,166,515 job postings for IT, Finance and Sales in U.S.
Source: 2020 Shifting Skills Survey for Employees; 2020 Shifting Skills Survey for HR Executives; Gartner TalentNeuron

Shortfalls of A Predictive Approach

Three Reasons A Predictive Approach Decreases Application



Source: Gartner

Is There a Third Way?

Skill Approaches



Reactive

- Fill skill requests as they come in from the business.
- Rely on proven processes that were effective in the past.
- Expect managers to help drive skill development when new needs arise.

Source: Gartner

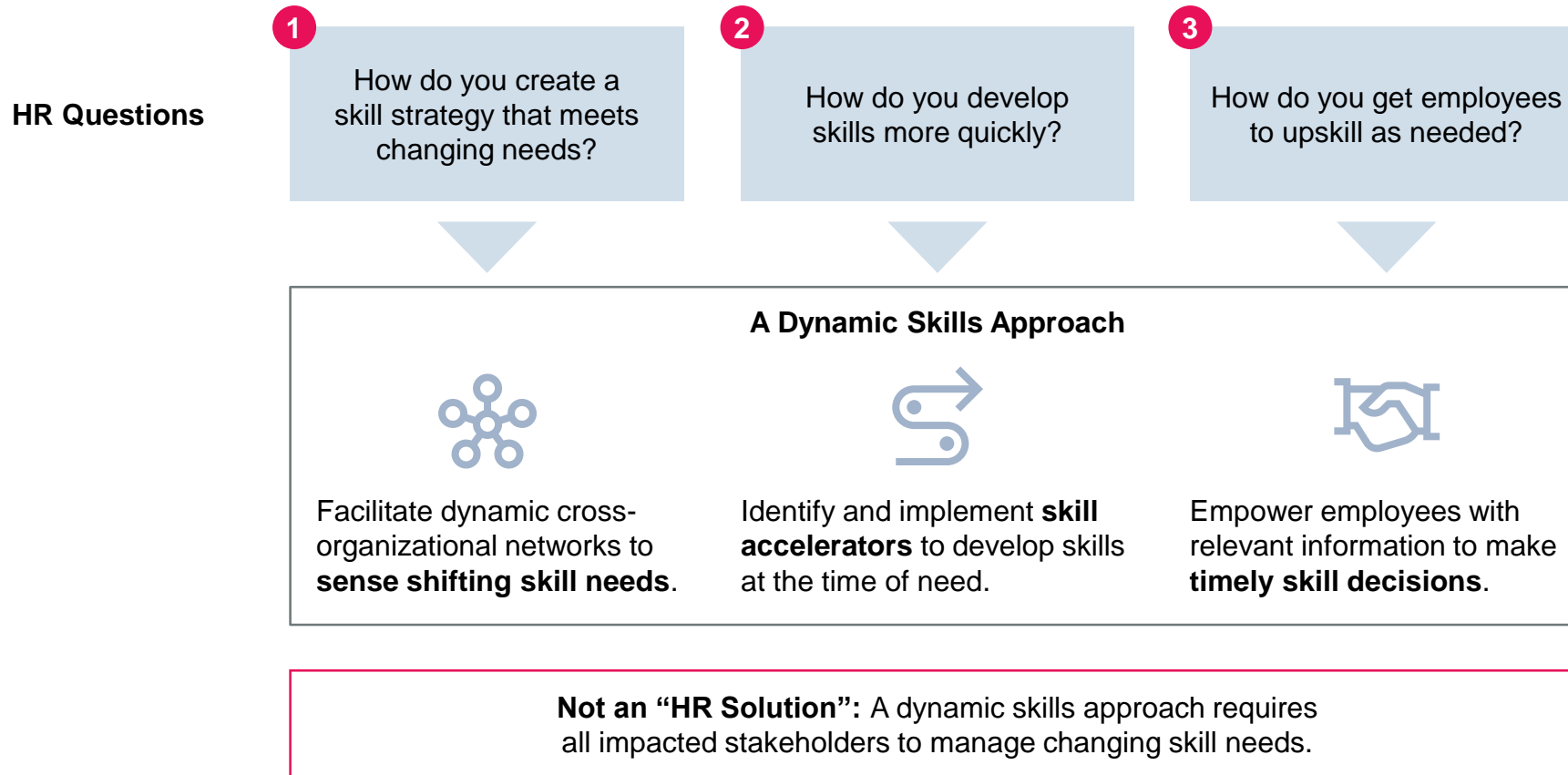


Predictive

- Focus on identifying a fixed set of future skills.
- Target investments at preemptive development programs.
- Inspire employees to adopt a learning mindset.

iterative fast
networked
adaptive **grounded**
imperfect
course-corrective

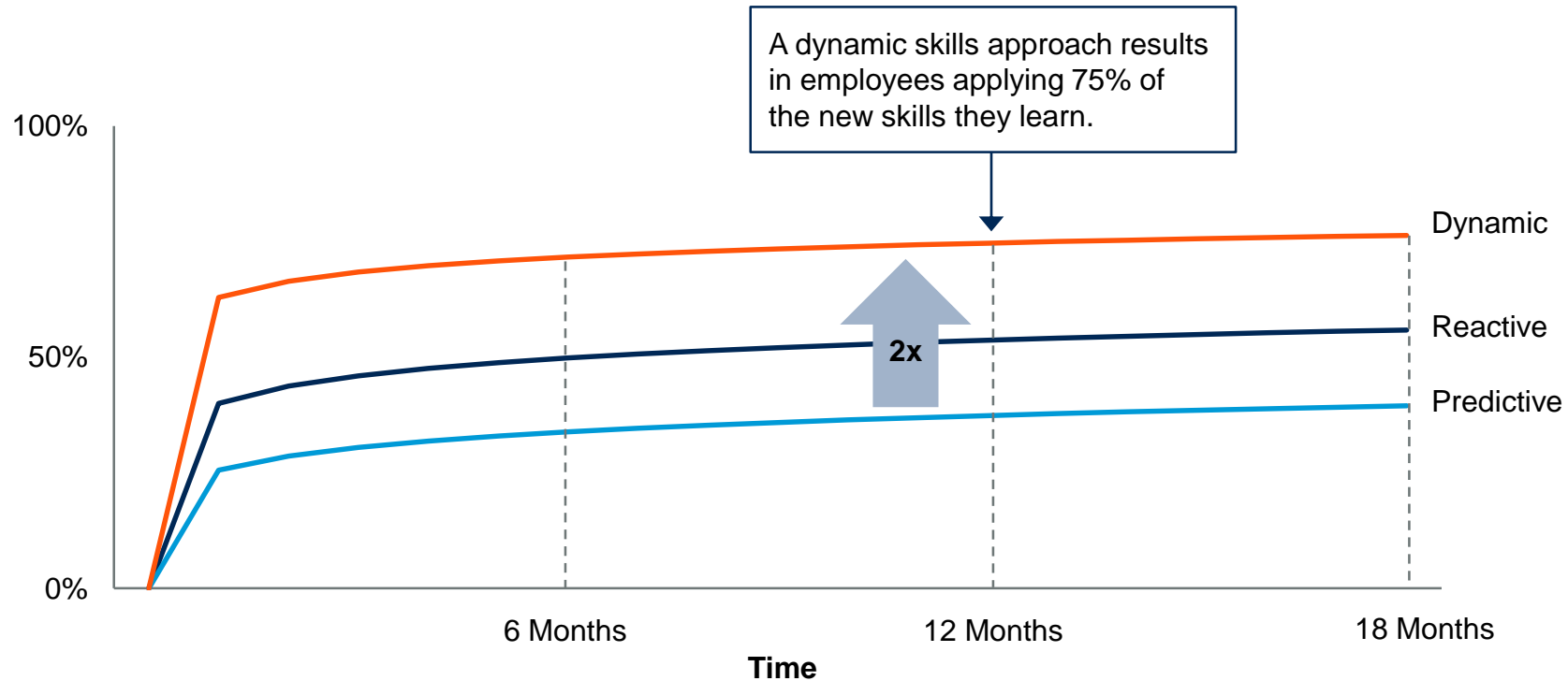
Better Approach: A Dynamic Skills Organization



Source: Gartner

Dynamic Approach Maximizes Application

New Skills Applied Over Time, by Skill Approach
Average Percentage of New Skills Applied

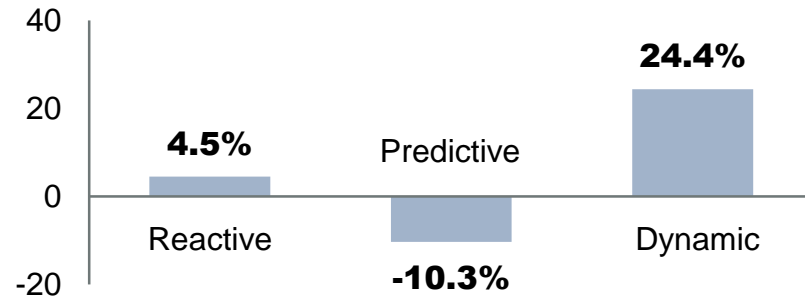


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Source: 2020 Shifting Skills Survey for Employees; 2020 Shifting Skills Survey for HR Executives; Gartner TalentNeuron

Dynamic Approach Boosts Key Talent Outcomes

Maximum Impact of Skill Approach on Employee Performance

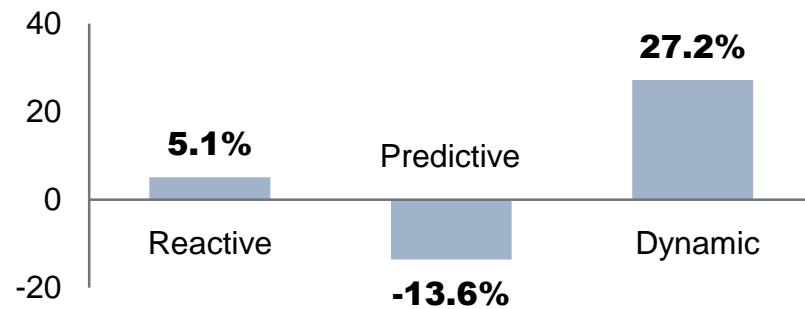
Percentage of Improvement



n = 6,510 employees
Source: 2020 Gartner Shifting Skills Survey for Employees

Maximum Impact of Skill Approach on Employee Skills Preparedness

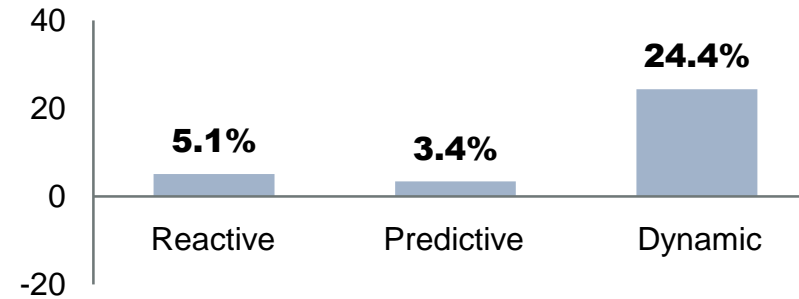
Percentage of Improvement



n = 6,510 employees
Source: 2020 Gartner Shifting Skills Survey for Employees
Note: See Appendix for additional methodology details.

Maximum Impact of Skill Approach on Employee Engagement

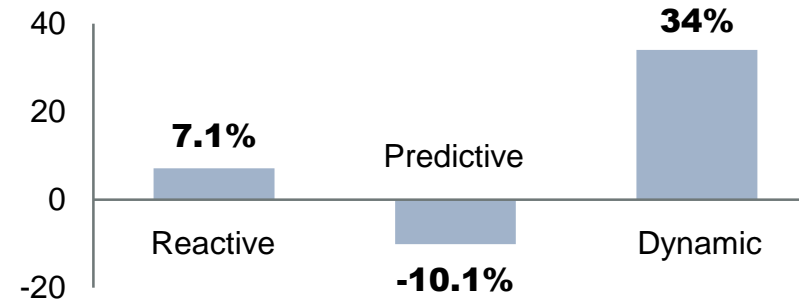
Percentage of Improvement



n = 6,510 employees
Source: 2020 Gartner Shifting Skills Survey for Employees









Maximum Impact of Skill Approach on Discretionary Effort

Percentage of Improvement











n = 6,510 employees
Source: 2020 Gartner Shifting Skills Survey for Employees

Building a Dynamic Skills Organization

1 Skills Sensing Network	2 Targeted Skill Accelerators	3 Two-Way Skill Transparency
 <p>Lloyds' Skill-Based Action Planning</p>  <p>New York Life's Skills Advisory Board</p>	 <p>CVS Health's Performance-Driving Learning Moments</p>  <p>Eastman's Internal Data Science Team Development</p>  <p>Gartner's Skill Disseminators</p>	 <p>Schlumberger's Skill Backpacks</p>  <p>EY's Personalized Role Transformation</p>  <p>Unilever's Open Talent Economy</p>

Prepare Dynamic Systems, Stop Trying to Predict Skills

Goals of Predictive and Dynamic Skills Approaches

	Predictive	Dynamic
Who	 The learning and development function is primarily responsible for addressing organizational skill needs.	 HR facilitates a collaborative network of cross-organizational skills stakeholders to sense and monitor shifting skills.
What	 Focused on identifying a fixed set of future skills .	 Focused on implementing transparent systems and strategies to nimbly respond to any skill need as it arises.
Why	 Develop future skills before shortages arise.	 Prepare employees to pivot skills as needs clarify .
How	 Develop new learning solutions that target future skill needs .	 Leverage existing resources to iterate and course correct solutions to fit today's environment.
Motto	"No room for error, we strive to get ahead of the skills we think you'll need."	"Ready to be wrong, we're optimized toward always-on sense and response."

Source: Gartner

Q & A

Thank You for Joining Us!

Upcoming Webinar: “The Credentialing Economy and What It Means for Cybersecurity Skills”

When: Tuesday, January 19, 2021, 2:00PM-3:00PM EST

Register:

<https://nist-nice.adobeconnect.com/webinarjan2021/event/registration.html>

nist.gov/nice/webinars