Critical edge: shaping the future of skills management for organizational success

Max Blumberg and Alec Levenson

Abstract

Purpose – *Organizations face increasing pressure to optimize their human capital management strategies in today's competitive business environment. As the nature of work evolves, the ability to identify, develop and leverage critical thinking skills has become paramount for organizational success. The purpose of this paper is to introduce the Critical Edge Skills Framework (CESF), a novel approach to skills management that focuses on the cognitive demands of various roles within an organization.*

Design/methodology/approach – *The CESF provides a structured method for categorizing skills based on the level of critical thinking required and the nature of the work involved. By adopting this framework, organizations can better align their talent acquisition, development and succession planning strategies with the cognitive demands of different roles, ultimately driving strategy execution, innovation and competitive advantage.*

Findings – *The CESF represents a significant advancement in how organizations approach talent acquisition, development and succession planning. By adopting this framework, organizations can better understand the cognitive demands of various roles, align talent with the appropriate level of critical thinking and ensure that employees are well-suited to the nature of their work, whether it involves designing or executing tasks.*

Originality/value – *This paper's skills taxonomy: provides a clear progression of cognitive abilities, from foundational skills to leadership and transformational thinking, allowing organizations to better understand critical thinking development; helps organizations identify the cognitive abilities required for different job roles, enabling more targeted and cost-effective talent acquisition, training and development; emphasizes the importance of higher-order thinking skills, which are crucial for driving innovation and organizational success; aligns with common educational frameworks, ensuring that graduates possess the critical thinking skills required by the modern workforce; and clarifies skill requirements, making it more manageable to determine the most suitable production resource for specific tasks. This optimizes the use of organizational resources and enhances productivity.*

Keywords *Skills, Human resource management, Talent*

Paper type *Conceptual paper*

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Introduction

Organizations face increasing pressure to optimize their human capital management strategies in today's competitive business environment. As the nature of work evolves, the ability to identify, develop and leverage critical thinking skills has become paramount for organizational success. This article introduces the Critical Edge Skills Framework (CESF), a novel approach to skills management that focuses on the cognitive demands of various roles within an organization.

The CESF provides a structured method for categorizing skills based on the level of critical thinking required and the nature of the work involved. By adopting this framework, organizations can better align their talent acquisition, development and succession planning strategies with the cognitive demands of different roles, ultimately driving strategy execution, innovation and competitive advantage.

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Applying critical thinking to skills management

Skills management involves determining the skills required to develop the organizational capabilities a company needs to deliver its business outcomes:

Individual skills → organizational capabilities → business outcomes

Figure 1, based on Levenson (2015), illustrates how skills at different levels of work (individual, team and business unit) contribute to business outcomes:

The figure embeds skills within the larger concept of capabilities, often called competencies at the individual level. A detailed discussion of skills versus competencies is beyond the scope of this article. However, it is worth noting that competencies were developed to be a more holistic concept than skills alone, also embodying knowledge, abilities and other characteristics, including on-the-job behaviors that demonstrate competence in performing work tasks (Campion *et al.*, 2011; Levenson, 2021).

While the CESF provides a valuable lens for understanding the cognitive abilities required at different levels of work, it should be integrated with other frameworks that consider technical, interpersonal and adaptability skills. By adopting a multidimensional approach, organizations can develop a more comprehensive understanding of the skills required for success in various roles and create targeted strategies for skill acquisition, development and deployment.

Competencies have been the dominant approach organizations have used to determine what individuals need to perform on the job in recent decades. Yet recently, there has been renewed interest in organizations addressing skills specifically. For this discussion, we will focus exclusively on skills while acknowledging that the discussion should be viewed as addressing one aspect of a larger continuum of characteristics related to individual capability and job performance.

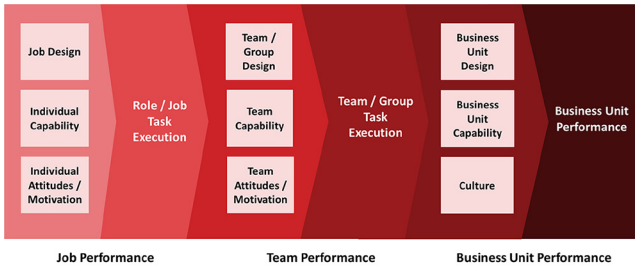
Generally speaking, these skills can be outsourced, automated/delivered by AI or performed by humans, depending on which production resources achieve the best balance between efficiency and effectiveness in delivering a particular skill.

Current skills management taxonomies

Skills management taxonomies categorize skills by proficiency, importance, relevance to the job or role and/or business function. For example:

1. By proficiency, using the example of math and analysis skills:
    - *Basic*: Such as data entry, basic arithmetic.
    - *Intermediate*: Such as spreadsheet manipulation, business writing.
    - *Advanced*: Such as statistical analysis, advanced problem-solving.

Figure 1 Causal model of business performance



Source: Authors' own work; based on Levenson (2015)

2. By importance:
    - *Core*: Essential for the job role, such as coding for a software developer.
    - *Supplementary*: Enhances performance, such as project management for a developer.
    - *Peripheral*: Useful but not critical, such as graphic design for a marketer.
3. By specificity:
    - *Role-specific*: Skills directly related to a job or occupation, such as surgery for a surgeon.
    - *Industry-specific*: Skills relevant to an industry, such as SEO for digital marketing.
    - *General*: Skills applicable across various roles, such as communication or teamwork.
4. By business function:
    - *Operational*: Skills necessary for daily operations, such as inventory management for a warehouse manager.
    - *Strategic*: Skills that design future operating procedures to address long-term goals, such as strategic planning for executives.
    - Enabling: Skills that support other functions, such as IT support for all departments.

Several taxonomies have been used over the years to describe the role of skills in delivering what matters most to the organization's success. Boudreau and Ramstad (2007) use the notion of "pivotal" versus "critical" versus "core" skills:

- *Pivotal skills*: These skills directly contribute to an organization's competitive advantage and are critical for future growth. They are often unique to the organization and challenging for competitors to replicate.
- *Critical skills*: Critical skills are essential for maintaining current operations and meeting short-term goals. While important, they may not provide a long-term competitive advantage.
- *Core skills*: Foundational skills are necessary for the organization to function but do not differentiate it from competitors. They are often readily available in the labor market.

Huselid and Becker (2011) categorize skills based on their impact on value creation:

- *Strategic skills*: These skills directly contribute to the development and execution of an organization's strategy. They align closely with the organization's core competencies and help drive long-term value creation.
- *Functional skills*: These skills are specific to individual departments or organizational functions. They enable the effective execution of day-to-day operations and support achieving functional goals.
- *Transactional skills*: These skills are required for routine, repetitive tasks that do not significantly differentiate the organization from competitors. They are often the focus of automation and process optimization efforts.

Employment law, in contrast, often differentiates between the skills needed at the time of entry versus what can be learned on the job. This distinction is important for determining the legal requirements for job postings and hiring practices.

While these taxonomies offer valuable insights into the role of skills in driving organizational success, the CESF provides a unique perspective by focusing on the cognitive abilities and critical thinking skills required at different work levels. By integrating the CESF with other taxonomies, organizations can better understand how various skill categories contribute to value creation and competitive advantage.

For example, the CESF's focus on critical thinking skills can help organizations identify which pivotal or strategic skills require higher cognitive ability and should be prioritized for development. Similarly, the CESF can inform decisions about which skills are most suitable for automation or outsourcing based on the level of critical thinking required.

By considering the different taxonomies and their relationships to the CESF, organizations can create a more nuanced and effective approach to skills management, ensuring that they are developing and deploying the right skills to drive organizational success.

The Critical Edge Skill Framework

CESF categorizes skills into three distinct tiers, each representing a progressively higher level of cognitive ability and critical thinking:

1. Tier 1: Foundational skills (remembering, understanding)
    - *Description*: This tier encompasses basic cognitive abilities, such as identifying information, clarifying and analyzing information and demonstrating curiosity.
    - Once learned, employees who primarily require foundational skills can perform their duties by recalling facts, understanding basic concepts, summarizing information and asking questions to seek further understanding. However, there is typically an initial learning curve to acquire these skills.
    - *Examples of skills*: Identifying information, clarifying and analyzing information, questioning and curiosity.
2. Tier 2: Applied critical thinking (applying, analyzing)
    - *Description*: This tier involves the application of knowledge and analysis of information to draw conclusions, evaluate arguments, solve problems and consider alternative viewpoints.
    - Employees in these roles must be able to apply their understanding of concepts to practical situations, analyze information critically and demonstrate open-mindedness in problem-solving.
    - *Examples of skills*: Inferencing and interpretation, evaluating arguments, problem-solving and open-mindedness.
3. Tier 3: Strategic and transformational thinking (evaluating, creating)
    - *Description*: This tier encompasses the highest cognitive abilities, including systems thinking, metacognition, innovative problem-solving, decision-making based on criteria and standards, strategic vision, ethical reasoning and driving change.
    - Employees in these roles must understand complex systems, reflect on their thought processes, design new frameworks, develop original ideas, make well-reasoned decisions, anticipate trends, craft strategic plans, articulate complex ideas, foster collaboration, make principled decisions and inspire others to champion solutions.
    - *Examples of skills*: Systems thinking and metacognition, innovative problem-solving and decision-making, strategic vision and foresight, ethical reasoning and principled decision-making, driving organizational change, communication and persuasion of complex ideas.

The design-execution dimension

In addition to the critical thinking dimension, the CESF also considers the type of work being performed, categorized as either designing or executing. This second dimension helps organizations better understand the nature of the tasks and skills required for various roles:

- *Designing*: Tasks that involve creating, planning or strategizing, such as developing a new product strategy, creating a comprehensive marketing plan, drafting a company-wide email or creating a simple spreadsheet.
- *Executing*: Tasks that involve implementing, performing or carrying out predefined processes, such as conducting data analysis, troubleshooting technical issues, assembling a product on a manufacturing line or responding to customer complaints.

By combining the critical thinking and design-execution dimensions, the CESF creates a 2 × 2 matrix (Table 1) that provides a more comprehensive view of the skills and cognitive abilities required for different roles within an organization.

The examples in the table are illustrations: all organizational tasks can be mapped to one of the four quadrants of the matrix. This matrix allows organizations to better align talent with the appropriate level of critical thinking and the nature of the work, ensuring that employees are well-suited to their roles and can contribute effectively to organizational success. Expanded CSEF examples are in the Appendix.

Advantages of the Critical Edge Skills Framework approach

A critical thinking skills taxonomy offers several benefits:

- It provides a clear progression of cognitive abilities, from foundational skills to leadership and transformational thinking, allowing organizations to better understand critical thinking development.
- It helps organizations identify the cognitive abilities required for different job roles, enabling more targeted and cost-effective talent acquisition, training and development initiatives.
- It emphasizes the importance of higher-order thinking skills, such as strategic and creative thinking, and leadership and transformational thinking, which are crucial for driving innovation and organizational success.
- It aligns with educational frameworks used by various institutions, facilitating collaboration and ensuring that graduates possess the critical thinking skills required by the modern workforce.
- It clarifies skill requirements, making it more manageable to determine the most suitable production resource (e.g. outsourcing, AI, human, etc.) for specific tasks. This ensures that tasks are assigned most efficiently and effectively, optimizing the use of organizational resources and enhancing productivity.

Table 1 The Critical Edge Skills Framework (CESF) matrix: integrating critical thinking and design-execution dimensions

Designing	- Drafting a company-wide email - Creating a simple spreadsheet	- Developing a new product strategy - Creating a comprehensive marketing plan
Executing	- Assembling a product on a manufacturing line - Performing routine data entry	- Conducting complex data analysis - Troubleshooting technical issues
	Low critical thinking	High critical thinking

Source: Authors' own work

Implications for skills management

Implementing the CESF has significant implications for skills management within organizations:

- *Talent acquisition*: By using the critical thinking skills taxonomy and the design-execution dimension to assess the cognitive abilities and skill levels required for specific roles, organizations can conduct a more targeted recruitment process, ensuring that candidates possess the necessary capabilities to succeed.
- *Learning and development*: The taxonomy can guide training and development initiatives, allowing organizations to design targeted programs that focus on the specific needs of each skill tier and the nature of the work (designing or executing). This approach maximizes the effectiveness of training investments and ensures that employees receive the support they need to excel in their roles.
- *Career progression and succession planning*: By recognizing the cognitive abilities required for different skill tiers and the type of work involved, organizations can create clear career paths that align with employees' strengths and potential for growth. This approach promotes employee engagement, retention and the development of a strong leadership pipeline.
- *Organizational effectiveness*: Adopting a skills-based management approach based on the CESF can improve overall organizational effectiveness. Organizations can optimize their human capital utilization and better achieve their strategic objectives by aligning talent with the right roles and providing targeted development opportunities.

Implementing a skills-based management approach can be challenging, as it may require significant changes to an organization's structure and practices. Some common obstacles include:

- *Resistance to change*: Employees and managers may be hesitant to embrace a new approach to talent management, particularly if it challenges long-standing practices or hierarchies.
- *Resource constraints*: Developing and implementing a skills-based management system can be resource-intensive, requiring significant investments in time, money and personnel.

To overcome these challenges, organizations can:

- *Involve key stakeholders in the planning process*: Engage employees, managers and executives in developing and implementing the CESF to build buy-in and ensure alignment with organizational goals.
- *Prioritize high-impact initiatives:* Focus on implementing the framework in areas where it will have the most significant impact, such as critical roles or departments, to demonstrate the value of the approach and build momentum for broader adoption.

Assessment of critical thinking and design-execution skills

Assessing an individual's critical thinking level and ability to design or execute tasks can be complex, requiring the development of new evaluation tools and methods, such as cognitive assessments, simulations or scenario-based exercises.

Many psychometric tools and assessment methods can be used to evaluate critical thinking skills, including:

- *Watson-Glaser critical thinking appraisal*: This widely used test assesses an individual's ability to recognize assumptions, evaluate arguments and draw conclusions.

- *California critical thinking skills test*: This test measures critical thinking skills in five areas: analysis, evaluation, inference, deductive reasoning and inductive reasoning.
- *Cornell critical thinking tests*: These tests, available in two levels, assess general critical thinking abilities such as induction, deduction, observation, credibility and assumption identification.
- *Halpern critical thinking assessment*: This assessment uses multiple-choice and open-ended questions to measure five dimensions of critical thinking: verbal reasoning, argument analysis, hypothesis testing, likelihood and uncertainty and decision-making and problem-solving.

In addition to these traditional psychometric tools, there has been a growing trend toward using modern techniques for critical thinking assessment, such as:

- *Game-based assessments:* Gamified assessments can provide engaging and interactive ways to evaluate critical thinking skills. These assessments often present learners with complex scenarios and challenges that require problem-solving, decision-making and strategic thinking. For example, the game "Portal" has been used to assess problem-solving and spatial reasoning skills.
- *Situational judgment tests (SJTs):* SJTs present candidates with realistic, job-related scenarios and ask them to choose the most appropriate response from a list of options. These tests can be designed to assess various aspects of critical thinking, such as problem-solving, decision-making and analytical reasoning. SJTs are increasingly being used in recruitment and selection processes across industries.
- *Virtual reality (VR) assessments:* VR technology can create immersive, realistic environments that challenge individuals to apply critical thinking skills more naturally and contextually. For example, a VR assessment could simulate a complex business scenario and evaluate how candidates gather information, analyze data and make decisions under pressure.
- *Adaptive assessments:* Adaptive assessments use algorithms to adjust the difficulty and content of questions based on an individual's performance. This approach allows for a more precise evaluation of critical thinking skills, as the assessment can hone in on the specific areas where an individual excels or struggles. Adaptive assessments can be integrated into various formats, such as traditional tests, games or simulations.

Organizations can combine these assessment methods with job simulations and work samples to assess an individual's design versus execution skills. For example, a candidate for a product manager role could be given a case study that requires them to develop a product strategy (designing) and then create a project plan for its implementation (executing). This approach allows organizations to evaluate candidates' ability to design and execute tasks relevant to their roles.

These techniques offer several advantages over traditional psychometric tools, including increased engagement, improved ecological validity and the ability to assess critical thinking and design execution skills in more realistic and dynamic contexts. As technology advances, we expect to see more innovative approaches to evaluating these abilities emerge.

Conclusion

The CESF represents a significant advancement in how organizations approach talent acquisition, development and succession planning. By adopting this framework, organizations can better understand the cognitive demands of various roles, align talent with the appropriate level of critical thinking and ensure that employees are well-suited to the nature of their work, whether it involves designing or executing tasks. This approach

fosters a culture of continuous learning and innovation, enabling organizations to thrive in an increasingly complex and competitive business landscape.

However, implementing the CESF comes with its own challenges. Organizations must be prepared to invest in developing new assessment tools, reevaluate traditional hierarchies and commit to continuous learning and development programs. To begin the implementation process, organizations can:

- *Conduct a skills audit*: Assess the current state of critical thinking and design-execution skills within the organization, identifying strengths, weaknesses and gaps.
- *Identify priority areas:* Determine which roles, departments or business functions would benefit most from applying the CESF and focus initial implementation efforts on these areas.
- *Develop targeted training programs:* Create learning and development initiatives tailored to each skill tier's specific needs and the nature of the work, leveraging existing resources and best practices.
- *Regularly reassess and adjust:* Continuously monitor the effectiveness of the implementation plan, gathering feedback from employees and stakeholders and making adjustments as needed to ensure the framework remains aligned with organizational goals and market demands.

By following these guiding principles and embracing the CESF, organizations can unlock the full potential of their workforce and position themselves for success in an increasingly complex and competitive business landscape.

As the world of work continues to evolve, the ability to effectively manage and develop critical thinking and design-execution skills will likely become an essential differentiator for organizations. Those who prioritize cultivating these skills in collaboration with educational institutions will be best positioned to drive innovation, adapt to change and thrive in the face of evolving challenges.

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Appendix 1. Expanded CESF examples

Table A1 Tier 1 - Foundational skills (remembering, understanding)

Job role or skill category	*Execution skills*	*Design skills*
Data entry clerk	- Accurately input data into systems -follow data entry procedures and guidelines - maintain data confidentiality	- Organize and format data for input - identify improvements in data entry processes
Customer service representative	- Respond to customer inquiries and complaints - follow communication scripts and protocols - document customer interactions	- Develop customized solutions for unique customer needs - identify opportunities to improve customer experience
Administrative assistant	- Manage calendars and schedules - prepare and distribute correspondence - maintain filing systems	- Create and improve organizational systems - design templates for documents and presentations

Source: Authors' own work

Table A2 Tier 2 - Applied critical thinking (applying, analyzing)

Job role or skill category	*Execution skills*	*Design skills*
Business analyst	- Gather and document business requirements - analyze data to identify trends and insights - prepare reports and presentations	- Design process improvements and solutions - create data models and visualizations
Software developer	- Write and test code based on specifications - debug and troubleshoot software issues - follow coding standards and best practices	- Design software architecture and interfaces - develop algorithms and data structures
Marketing specialist	- Execute marketing campaigns and initiatives - analyze campaign performance metrics - prepare marketing reports and updates	- Develop marketing strategies and plans - create content and messaging for target audiences
Financial analyst	- Analyze financial data and create models - prepare financial reports and presentations - monitor and interpret financial metrics	- Design financial analysis frameworks and tools - develop financial forecasting models

Source: Authors' own work

Table A3 Tier 3 - Strategic and creative thinking (evaluating, creating)

Job role or skill category	*Execution skills*	*Design skills*
Management consultant	- Conduct research and analysis for client projects - implement recommendations and solutions - manage project timelines and deliverables	- Design strategic frameworks and models - develop innovative solutions to complex problems
Product manager	- Coordinate product development and launch activities - gather and analyze product performance data - manage product roadmaps and backlogs	- Define product vision and strategy - design user experiences and interfaces
Research scientist	- Conduct experiments and collect data - analyze and interpret research findings - prepare research reports and presentations	- Design research studies and methodologies - develop new theories and models
Creative director	- Oversee the execution of creative projects - manage creative teams and resources - ensure brand consistency across all creative outputs	- Develop creative concepts and strategies - design brand identities and guidelines

Source: Authors' own work

Table A4 Tier 4 - Leadership and transformational thinking (creating)

Job role or skill category	*Execution skills*	*Design skills*
Senior executive	- Implement organizational strategies and initiatives - make high-stakes decisions based on data and insights - communicate vision and goals to stakeholders	- Develop long-term strategic plans - design organizational structures and processes
Thought leader	- Communicate ideas and insights through various channels - engage in public speaking and thought leadership activities - build and maintain professional networks	- Develop innovative concepts and frameworks - design compelling narratives and stories
Entrepreneur	- Execute business plans and strategies - manage financial and human resources - adapt to changing market conditions and customer needs	- Design business models and value propositions - develop product and service innovations
Strategist	- Analyze market trends and competitive landscapes - implement strategic initiatives and programs - monitor and evaluate strategic performance	- Design strategic frameworks and roadmaps - develop scenario plans and contingency strategies

Source: Authors' own work