BioTalent

PHARMA AND BIOTECH 2030

Building the execution engine for the next decade of biopharma

LEK

BioTalent perspectives, supported by L.E.K. Consulting

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> "In modern biopharma, human capability is not support infrastructure; it is the operating system that determines performance."
> — James Cox, Founder & CEO at BioTalent

Foreword

There is renewed momentum within biopharma: capital inflows are strengthening, pipelines are advancing and deal activity is recovering. Yet the competitive landscape is structurally shifting. Modality expansion, digital systematisation and rising operational intensity are increasing the demands placed on organisations across development and manufacturing.

In this environment, performance dispersion is widening. Some companies are converting innovation and investment into durable financial stability; others are experiencing volatility despite strong assets and funding.

This report integrates L.E.K. Consulting's market and modality analysis with BioTalent's Talent Science and workforce performance modelling to provide a unified view of competitive advantage through 2030. Together, we examine how modality complexity, digital infrastructure and workforce capability interact to shape enterprise outcomes.

Our aim is not only to describe where the industry is heading, but to provide leaders with a practical lens on how execution capability is measured, aligned and systematically managed to define the next phase of value creation.

BioTalent would like to thank L.E.K. Consulting for their valuable support and contribution to this report.

Executive summary

Biopharma entered 2026 with renewed capital inflows, strengthening late-stage pipelines and re-accelerating strategic M&A activity. Yet this recovery coincides with rising structural complexity.

Pricing reform, geopolitical fragmentation, supply-chain concentration, and escalating modality intensity are increasing execution demands across development and manufacturing.

Across this environment, a clear pattern is emerging: scientific innovation and access to capital, while necessary, no longer guarantees value creation. The differentiator now is execution capability, the organisation's ability to reliably translate strategy, assets and investment into measurable performance.

Three structural shifts define this transition:

1. Modality expansion: ADCs, radiopharmaceuticals, and advanced biologics introduce materially higher CMC complexity, analytical intensity, and supply-chain fragility.

2. Digital systematisation: AI-enabled workflows, digital twins, and algorithmic quality systems are becoming core operational infrastructure, increasing both efficiency potential and dependency on integrated data environments.

3. Workforce capability as performance infrastructure: Variation in capability density, digital fluency and workforce stability now explains measurable dispersion in throughput reliability, margin stability, and valuation multiples. Organisations outperforming through 2025–2026 combine technological investment with strong alignment across scientific platforms, digital architecture and workforce capability.

Firms that treat talent as a measurable system, tracking volatility, capability concentration, and digital alignment, translate capital into performance with greater consistency and predictability.

Strategic context: A recovery under rising execution thresholds

Biopharma funding cycles over the past decade reflect pronounced volatility. The pre-pandemic expansion phase was followed by an unprecedented COVID-era capital surge, then a significant correction and stabilisation period.

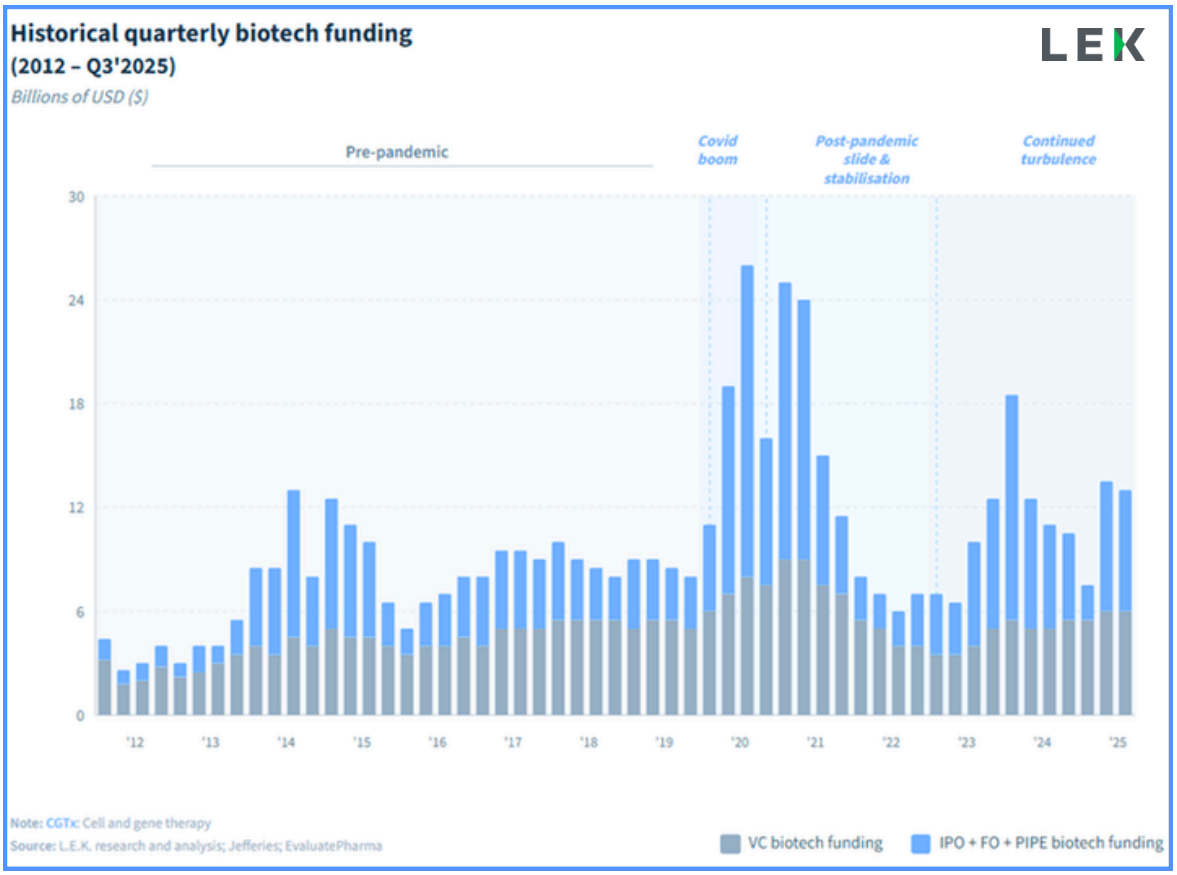

Figure 1. Historical Quarterly Biotech Funding (2012–Q3 2025)
(Data Source: L.E.K. Consulting Analysis)

Figure 1 illustrates sustained pre-pandemic growth, the 2020–2021 capital surge, and the subsequent normalisation period. While venture capital activity has remained comparatively resilient, public markets have been more sensitive to macroeconomic tightening and investor risk recalibration.

IPO activity remains below pandemic peaks but shows renewed Q4 2025 momentum.

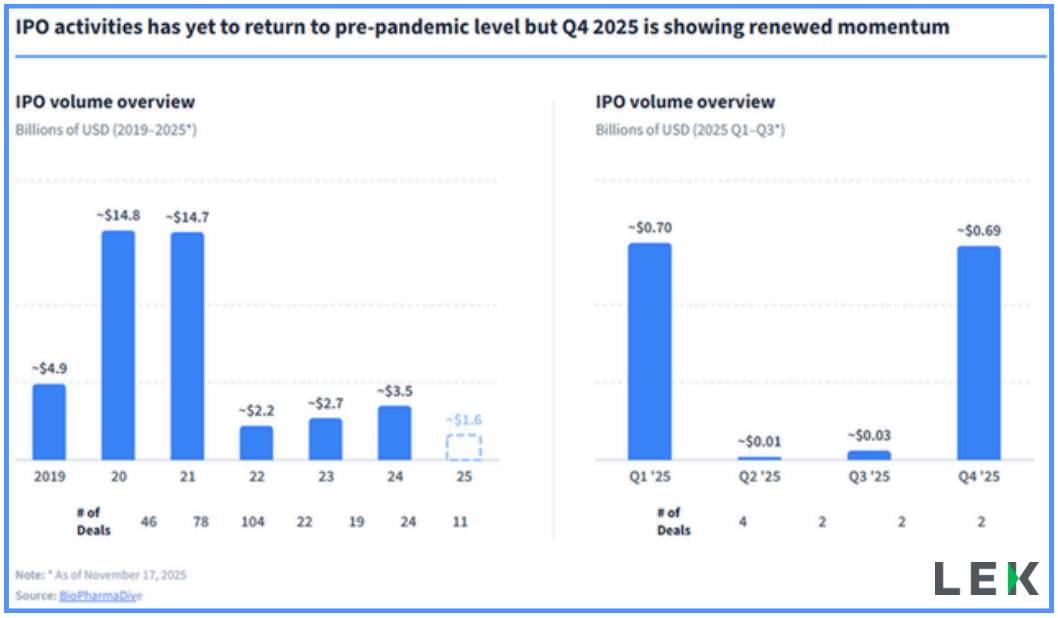

Figure 2. IPO Volume Overview and Q1–Q3 2025 Trends
(Data Source: L.E.K. Consulting Analysis)

Strategic acquisitions by large-cap pharma have stabilised at levels consistent with long-term trends, driven by late-stage asset replenishment and access to differentiated platforms.

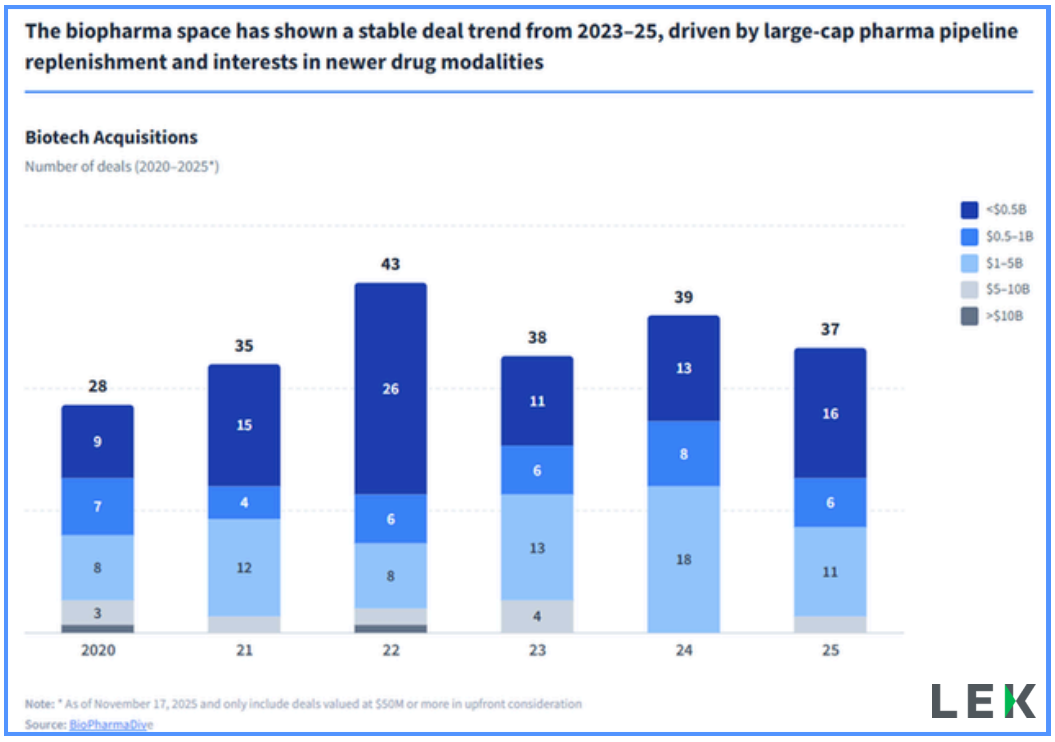

Figure 3. Biopharma Acquisition Trends (2020–2025)
(Data Source: L.E.K. Consulting Analysis)

Strategic context: An improving capital environment

The capital environment is improving. At the same time, capital allocation behaviour has shifted. Investment is increasingly directed toward organisations demonstrating execution readiness rather than pipeline potential alone.

Execution readiness now reflects:

- CMC maturity
- Digital infrastructure coherence
- Workforce capability stability
- Regulatory-operational integration

The constraint on value creation is no longer funding availability alone, but the reliability with which companies convert capital into milestone delivery.

Market outlook: Value migrates to execution capability

Modality expansion increases operational intensity

Macroeconomic conditions are stabilising, while operating thresholds across biopharma have materially increased.

Three structural forces are reshaping competitive dynamics:

1. New modalities introduce higher CMC cost per asset, tighter analytical requirements, and greater process sensitivity.

2. ADCs require conjugation precision and payload handling sophistication. Radiopharmaceuticals demand isotope logistics and time-sensitive manufacturing.

3. CGT platforms remain highly skill-intensive despite standardisation progress.

These modalities elevate the operational risk profile per asset.

Figure 4. Modality & Manufacturing Evolution (Panels A–C)
(Data Source: L.E.K. Consulting Analysis; BioTalent Analysis)

Panel A illustrates the growing share of complex biologics, ADCs, and radiopharmaceuticals in late-stage pipelines.

Panel B reflects increasing per-asset CMC investment requirements.

Panel C demonstrates the transition toward digitally mediated manufacturing workflows.
The implication is clear: scientific opportunity is expanding, but execution tolerance is narrowing.

Market outlook continued

Digital systematisation raises the performance ceiling and the risk floor

Digital infrastructure is transitioning from pilot programs to enterprise operating fabric. Digital twins, AI-enabled quality analytics, algorithmic scheduling, and advanced process analytics are embedding into core workflows.

This shift increases:

- Potential efficiency gains
- Deviation reduction opportunities
- Data-driven decision speed

However, digital infrastructure also increases dependency on workforce capability alignment. High digital maturity without sufficient capability density results in underutilised systems, override behaviours, and reduced ROI.

Workforce capability as a structural determinant of performance

As modality complexity and digital integration rise simultaneously, workforce capability becomes a central performance variable rather than a support function.

Across manufacturing and development environments analysed by BioTalent, three measurable dimensions correlate with operational stability:

1. Capability density in critical roles
2. Onboarding velocity for new hires
3. Workforce stability under operational stress

Together, these dimensions form Talent Efficiency (TE), a predictive indicator of:

- Throughput variance
- Deviation frequency
- Digital adoption velocity
- EBITDA stability

Organisations demonstrating strong alignment between digital maturity and Talent Efficiency consistently outperform peers across margin resilience and valuation stability.

The market is therefore migrating from asset-centric competition toward execution-centric differentiation.

Modality evolution: Implications for CMC, analytics and manufacturing

The late-stage pipeline composition has shifted materially over the past seven years. Small molecules now represent a declining share of total assets, while complex biologics, ADCs and radiopharmaceuticals continue to expand. This evolution reflects more than scientific progress; it carries significant operational implications.

As modality intensity increases, so does:

- Analytical complexity
- Process sensitivity
- GMP risk exposure
- Data dependency
- Workforce skill intensity

Execution risk per asset is rising.

Antibody–Drug Conjugates (ADCs)

ADCs have moved from niche to core oncology platforms. Clinical performance has accelerated investment in conjugation technologies, linker optimisation, payload refinement, and site-specific chemistry.

Operational implications include:

- Higher analytical sensitivity requirements
- Tighter process control thresholds
- Increased reliance on automation for reproducibility
- Greater interdependence between chemistry, biology, and engineering

These demands increase the importance of digitally integrated CMC systems and strong cross-functional capability density. Variability in ADC performance increasingly reflects the quality of system integration and operational execution, rather than scientific design alone.

Radiopharmaceuticals

Radiopharmaceutical growth exceeds 16% CAGR, constrained primarily by isotope supply, specialised GMP infrastructure and precision logistics.

The modality introduces structural fragility:

- Time-sensitive production windows
- Short half-life constraints
- Complex regulatory oversight
- Cold-chain and transport dependencies

Execution reliability requires:

- End-to-end digital traceability
- Real-time scheduling optimisation
- Highly trained hybrid operators
- Strong regulatory coordination

Performance dispersion across radiopharma platforms is increasingly explained by system coherence rather than asset design.

Cell & Gene Therapy (CGT)

CGT has transitioned from rapid expansion to disciplined manufacturability focus. While automation and process standardisation are improving predictability, the modality remains the most skill-intensive segment of biopharma.

Execution bottlenecks commonly arise from:

- Analytical development constraints
- Aseptic operations instability
- Systems integration gaps
- Technology transfer variability

Cycle-time extension in CGT environments often correlates more strongly with capability density and stability than with capital investment levels.

Manufacturing Workflow Evolution

Manufacturing has undergone a structural transformation. Digitally mediated workflows have expanded from less than 25% of process hours in 2018 to more than 60% by 2025.

This evolution increases the need for:

- Hybrid technical roles
- Data-literate operators
- Systems integration engineers
- MES/LIMS governance capability

Scientific opportunity is expanding across modalities, but the tolerance for execution failure is narrowing. Capability gaps now translate rapidly into financial variance.

Digital infrastructure: AI as an operational fabric

AI has transitioned from isolated pilots to embedded operational infrastructure across discovery, development and manufacturing

Applications now include:

- Digital twins for predictive manufacturing control
- Algorithmic quality monitoring
- Automated scheduling optimisation
- Multimodal discovery modelling
- Closed-loop process adjustments

Digital transformation increases potential performance ceilings but also raises dependency on coherent human–system alignment.

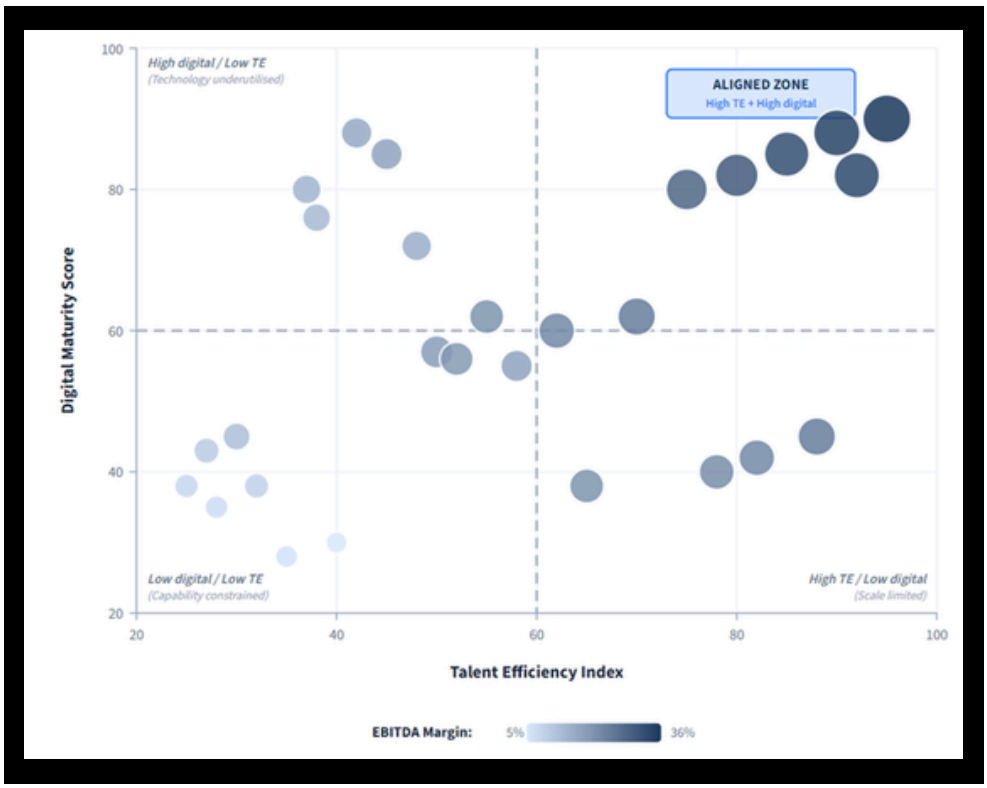

Figure 5. Digital Maturity vs Talent Efficiency Alignment Curve
(Data Source: BioTalent Analysis)

Digital maturity and talent efficiency alignment

Digital infrastructure alone does not define performance outcomes. Performance depends on the degree of alignment between digital maturity and workforce capability.

Four performance states emerge:

1. **High digital, high TE**

→ Scalable performance, accelerated adoption, lower deviation rates, stronger margin stability

2. **High digital, low TE**

→ Underutilised systems, override behaviours, increased operational noise

3. **Low digital, high TE**

→ Stable human performance but limited scalability

4. **Low digital, low TE**

→ Elevated compliance risk, cost inflation, throughput instability

The evidence indicates that digital transformation is fundamentally a capability transformation. AI ROI depends on capability density and stability as much as on system architecture.

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Workforce capability: The primary driver of execution performance

Workforce systems have transitioned from HR constructs to strategic operating infrastructure. Across biopharma sites analysed globally, measurable workforce variables correlate with financial and operational outcomes.

Structural workforce recomposition

Automation and digital systematisation are altering role composition.

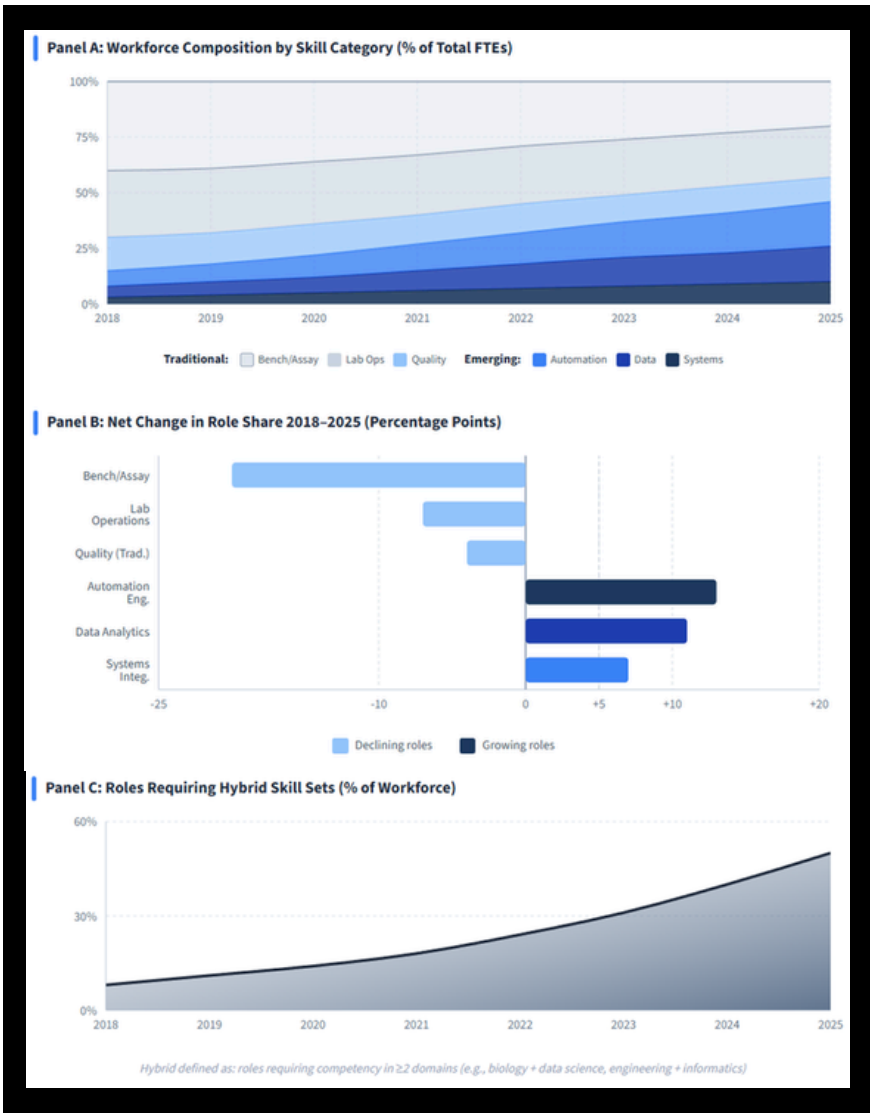

Figure 6. Workforce Composition & Hybrid Role Growth (Panels A–C)
(Data Source: BioTalent Analysis)

Panel A: Shift in major skill categories
Panel B: Net percentage-point change in role share
Panel C: Growth in hybrid bio–data–automation roles

Key structural changes include:

- Decline in purely manual roles
- Expansion of automation engineering
- Growth in data-integrated manufacturing roles
- Rapid expansion of hybrid competencies

Hybrid roles are projected to represent 40–50% of the workforce by 2026 in digitally advanced environments.

Capability density and stability as reliability drivers

High capability density correlates with:

- Lower cycle-time variance
- Faster deviation resolution
- Improved digital utilisation
- Reduced quality-event propagation

Role stability amplifies these effects by preserving institutional knowledge and accelerating digital adoption curves.

Stable, high-density teams function as execution stabilisers in complex environments.

Workforce volatility as a leading indicator of risk

Workforce volatility consistently precedes performance deterioration.

Observed correlations include:

- Rising churn → Margin erosion
- Capability loss → Deviation frequency increase
- Leadership instability → Delayed milestone achievement
- Digital underperformance → Elevated operational noise

Volatility is therefore a predictive risk signal, not a lagging HR metric.

Workforce capability: Talent Efficiency as a measurement framework

Talent Efficiency (TE) integrates:

- Capability density
- Onboarding velocity
- Workforce stability

TE correlates with:

- Throughput reliability
- Batch-release velocity
- Deviation frequency
- EBITDA variability

TE serves as the analytical bridge between workforce capability and financial performance.

Organisations monitoring TE alongside operational KPIs demonstrate earlier detection of execution fragility and more resilient margin performance.

Capital, risk and valuation: Execution capability as a financial asset

Execution capability is increasingly reflected in valuation dispersion

Panel D: Illustrative Valuation Multiple Build-Up

Component	Aligned Firm	Misaligned Firm	Delta
Sector base multiple	10.0×	10.0×	—
Margin premium	+3.2×	+0.8×	+2.4×
Capability stability premium	+2.5×	+0.4×	+2.1×
Execution risk discount	−1.2×	−3.8×	+2.6×
Implied EV/EBITDA	**14.5×**	**7.4×**	**+7.1×**

Figure 7. Capability Stability & Financial Outcomes (Panels A–D)
(Data Source: BioTalent Analysis; L.E.K. Consulting Analysis)

Panel A: Capability Stability Index vs EV/EBITDA
Panel B: Margin performance dispersion
Panel C: Investor risk discount factors
Panel D: Illustrative valuation multiple build-up

Winning organisations synchronise human and digital systems

A 10-point improvement in capability stability correlates with measurable uplift in EV/EBITDA and reduction in execution-risk discounting

Aligned organisations demonstrate:

- Higher gross margins
- Stronger operating margins
- Reduced free-cash-flow volatility
- Lower investor-perceived integration risk

Misaligned organisations experience amplified risk premiums and margin compression.

Capability stability is emerging as a financial multiplier.

The 2030 enterprise: A unified execution system

Leading organisations are constructing three integrated platforms:

1. **Scientific platform**
   - Modality-agnostic CMC systems
   - Manufacturability-first asset design
   - Standardised analytical frameworks
   - Scalable process architectures

2. **Digital platform**
   - Enterprise data fabrics
   - Integrated MES/LIMS governance
   - Digital twins and algorithmic QC
   - AI-enabled decision pathways

3. **Workforce capability platform**
   - Structured digital-fluency pathways
   - Hybrid capability development
   - TE-based workforce monitoring
   - Volatility management frameworks

The integration of these three platforms determines execution resilience.

Organisations that govern them as a unified system convert capital into predictable milestone delivery. Those that treat them independently experience escalating complexity drag.

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Conclusion

Biopharma's competitive landscape is transitioning

Scientific innovation remains necessary. Digital investment remains essential. Capital remains available. But none of these variables independently determines value creation.

Execution capability, defined as the integration of modality complexity, digital infrastructure and workforce performance, is now the primary determinant of enterprise outcomes.

Through 2030, organisations that convert technological opportunity into financial stability will be those that:

- Measure capability density
- Monitor volatility
- Align digital maturity with workforce readiness
- Treat Talent Efficiency as a predictive metric

Human capability is no longer a support function — it is the operating infrastructure through which biopharma value is realised.

> "The winners will be those that treat human capability not as a support function, but as the operating system of the modern biopharma enterprise."
> — Dr Jason Beckwith, Founder of Talent Science™

Talent Science in action

BioTalent hosts **Talent Boardroom** events across the globe: intimate, invite-only sessions bringing together founders, CEOs, COOs and functional leaders from SME and growth-stage life sciences companies to explore how Talent Science can unlock sustainable growth.

To learn more and get involved, click here.

About the author

Dr Jason Beckwith – Founder & Architect, Talent Science™ and Vice President of Talent Science & Thought Leadership at BioTalent

Dr Jason Beckwith is a leading authority in biopharmaceutical workforce analytics and the creator of the Talent Efficiency (TE) and Biopharma Talent Index (BTI) frameworks. His work applies quantitative modelling, complexity science, and predictive analytics to human capital strategy, enabling organisations to link workforce performance directly to operational reliability, digital transformation outcomes, and enterprise value.

Drawing on research conducted at the University of Dundee, UCL and across more than four hundred global biopharma sites, Dr Beckwith integrates methods including Monte Carlo simulation, Bayesian inference, synchrony modelling, frontier analysis, network optimisation, and workforce Value-at-Risk (WVaR). These approaches quantify capability alignment, stability, drag, volatility, and transformation readiness with a level of precision not achieved by traditional HR analytics.

With over 30 years of international experience across biotech, pharma, CDMO and advanced therapy organisations, he has advised global leadership teams on capability design, AI and automation strategy, post-merger integration, site transformation, and workforce engineering. His work has appeared in BioProcess International, GEN, and other industry publications, and he is frequently invited to speak at BPI Boardroom, CPhI, 'The Economist', DCAT, BIO, NIBRT and ATMP-focused events.

At BioTalent, Dr Beckwith leads the firm's Talent Science & Predictive Analytics practice, supporting CHROs, COOs and CFOs in building future-ready workforces, reducing operational risk and accelerating technology adoption.

For a complimentary Talent Science roadmap tailored to your organisation, contact:
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Dr Jason Beckwith
Founder of Talent Science™


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