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University Spin-Off Readiness in Multidisciplinary Research Teams

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Abstract

University research increasingly addresses technically and socially complex problems through multidisciplinary teams that combine scientific, engineering, clinical, computational, design, and management expertise. Such intellectual diversity can strengthen opportunity recognition and technological problem solving, yet it does not automatically create a venture capable of commercialization. Academic spin-off formation requires research teams to move from scientific achievement toward coordinated decisions concerning technology maturity, intellectual-property ownership, market need, entrepreneurial roles, resource mobilization, and institutional separation from the parent university. This study develops a University Spin-Off Readiness Framework for Multidisciplinary Research Teams (USR-MRT) that treats commercialization readiness as a multidimensional team capability rather than a consequence of research quality alone.

The framework incorporates six dimensions: technology validation, market-problem validation, intellectual-property readiness, entrepreneurial capability, multidisciplinary team integration, and university commercialization support. Because no actual university commercialization, patent, licensing, venture-team, or spin-off dataset was supplied, a transparent simulation-based explanatory design was adopted. Five synthetic team-maturity conditions ranging from 20% to 100% were analyzed. The simulated University Spin-Off Readiness Index increases from 37 to 89 across these conditions. Simultaneously, validated customer-problem understanding rises from 30% to 86%, intellectual-property preparedness from 42% to 92%, role clarity from 35% to 91%, and investor-readiness assessment from 24% to 81%, while estimated commercialization-decision delay declines from 26 to 8 weeks.

The analysis indicates that multidisciplinary diversity becomes commercially valuable only when teams possess mechanisms for integrating disciplinary knowledge, resolving ownership and leadership ambiguity, translating technology into a credible market proposition, and accessing institutional commercialization resources. The paper contributes to academic-entrepreneurship research by positioning spin-off readiness as a pre-formation capability that can be assessed before formal incorporation. All numerical findings are simulated and should be interpreted as theoretical scenario evidence rather than empirical estimates of actual university spin-offs.

Keywords: university spin-off, academic entrepreneurship, multidisciplinary research teams, technology commercialization, entrepreneurial capability, intellectual property, research commercialization, venture readiness

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1. Introduction

Universities increasingly participate in economic and societal development through mechanisms extending beyond teaching and academic publication. Patenting, licensing, industry collaboration, consultancy, and the formation of university spin-off companies provide pathways through which research-generated knowledge can be transferred beyond the academic environment. University spin-offs are particularly significant because they create independent organizational vehicles around knowledge, intellectual property, or technologies originating from university research. Research by Vohora, Wright, and Lockett demonstrates that the emergence of university high-technology spin-outs is not a single event but a developmental process characterized by critical transitions that ventures must overcome.

Spin-off creation becomes especially complex when the originating technology is developed by multidisciplinary research teams. Contemporary research projects frequently combine several knowledge domains because technically complex innovations cannot always be developed within one discipline. A biomedical platform, for example, may involve medicine, molecular science, electronics, software, statistics, regulatory knowledge, and product design. Such breadth can increase the range of knowledge available to a prospective venture, but team heterogeneity also introduces differences in professional language, assumptions, incentives, decision criteria, and expectations concerning commercialization. Vanaelst and colleagues' study of academic spin-out teams showed that team heterogeneity and team composition evolve as ventures pass through different developmental stages, demonstrating that the academic team capable of producing an invention may not automatically possess all competencies required for commercialization.

The transition from a research project to a commercial venture also demands competencies that are not identical to scientific capability. Academic founders must evaluate whether the technology can be reliably reproduced, whether intellectual-property rights can be protected or licensed, whether a sufficiently important customer problem exists, whether the market can support an independent venture, and whether an entrepreneurial team can mobilize resources beyond the university. Rasmussen, Mosey, and Wright's longitudinal research demonstrates that entrepreneurial competencies in university spin-offs develop progressively rather than being fully available at venture inception. Their later work further shows that university departments can influence the evolution of these competencies and early venture development.

Institutional context adds another layer to the readiness problem. Universities differ substantially in commercialization policies, technology-transfer capabilities, intellectual-property arrangements, entrepreneurial culture, incubator access, proof-of-concept funding, and relationships with external entrepreneurs and investors. Thomas and colleagues' work on pre-formation university spin-offs specifically emphasizes the importance of building entrepreneurial capabilities before company formation, while Calderón-Hernández, Jiménez-Zapata, and Serna-Gomez show that institutional barriers can materially constrain spin-off creation. Consequently, formal incorporation should not be treated as evidence that a research team was commercially ready; premature company formation can simply transfer unresolved technological, market, and team uncertainties into a legally constituted organization.

The present study therefore develops the concept of University Spin-Off Readiness in Multidisciplinary Research Teams.

Readiness is defined as the extent to which a research team has generated sufficient technological evidence, commercial understanding, intellectual-property clarity, entrepreneurial competence, team integration, and institutional support to make a defensible decision about creating an independent venture. The study does not assume that every promising research project should become a spin-off. Licensing, collaborative research, open dissemination, or continued academic development may be more appropriate commercialization pathways for some technologies. Instead, the framework is designed to determine whether a team considering spin-off formation possesses the conditions necessary to proceed responsibly. A simulation-based methodology is used because no real university venture dataset was supplied.

2. Objectives of the Study

2.1 To Conceptualize Spin-Off Readiness Before Formal Venture Creation

The first objective is to distinguish spin-off readiness from spin-off formation. Academic-entrepreneurship research frequently examines how ventures are established, how they grow, and how university environments influence their subsequent performance. Vohora, Wright, and Lockett, however, demonstrate that spin-off development involves identifiable critical junctures, including opportunity recognition, entrepreneurial commitment, credibility development, and resource acquisition. These transitions suggest that meaningful readiness emerges progressively before and during organizational formation rather than appearing automatically once a company is registered.

The present paper consequently treats readiness as a pre-formation decision condition. A multidisciplinary research team can be scientifically successful while remaining commercially immature. Conversely, a team may have significant commercial interest but lack intellectual-property freedom or sufficient technical reproducibility. The framework therefore seeks to identify readiness gaps before incorporation, when they can still be addressed through experimentation, market discovery, team development, licensing clarification, or institutional support.

2.2 To Examine the Role of Multidisciplinary Team Integration

The second objective is to investigate multidisciplinary composition as both an asset and a potential commercialization constraint. Vanaelst and colleagues found that academic spin-out teams change in composition and strategic orientation as ventures develop, indicating that heterogeneity itself does not guarantee entrepreneurial effectiveness. Multidisciplinary teams may possess broader knowledge but can simultaneously experience coordination problems when team members differ substantially in terminology, professional priorities, research incentives, and interpretations of commercial risk.

The proposed framework therefore separates disciplinary diversity from team integration. Readiness is expected to increase not simply when more disciplines are represented, but when knowledge from those disciplines can be translated into shared product definitions, customer propositions, development priorities, decision rights, and venture roles. Team integration consequently becomes an explicit component of spin-off readiness.

2.3 To Develop and Evaluate a Multidimensional Readiness Framework

The third objective is to develop a measurable readiness architecture incorporating technological, commercial, legal, team, entrepreneurial, and institutional conditions. This approach is consistent with evidence showing that university spin-off development depends on multiple interrelated resources and capabilities rather than a single predictor. Mathisen and Rasmussen's critical review concludes that spin-off development, growth, and performance are influenced by factors operating at several stages of venture evolution.

The study uses simulated scenarios to examine how increasing multidisciplinary commercialization capability could influence overall readiness, customer validation, intellectual-property preparedness, venture-role clarity, investor preparedness, and commercialization speed. The simulation provides a testable analytical structure but does not substitute for empirical university data.

3. Review of Literature

3.1 University Spin-Off Formation as a Developmental Process

University spin-off creation is fundamentally different from simply converting a research project into a registered business entity. Franklin, Wright, and Lockett's work on academic and surrogate entrepreneurs identified the importance of combining scientific inventors with commercially experienced entrepreneurial actors. The study highlighted a recurring challenge in university commercialization: researchers may possess indispensable technical knowledge while lacking some of the business capabilities necessary to develop a venture. This creates a team-formation problem as much as a technology-transfer problem.

Vohora, Wright, and Lockett subsequently conceptualized spin-out development through a sequence of developmental phases and critical junctures. Their analysis demonstrates that ventures must develop entrepreneurial commitment, credibility, and resource configurations before they can move successfully toward sustainable commercialization. This process perspective is central to the present study because readiness cannot be reduced to one technical milestone such as patent filing or prototype completion.

Clarysse and colleagues also showed that research organizations employ different incubation strategies when generating new research-based ventures. This indicates that the institutional pathway surrounding a spin-off affects how resources, entrepreneurial capabilities, and organizational support become available. University spin-off readiness should therefore be assessed within the commercialization environment surrounding the team rather than treated exclusively as a characteristic of individual researchers.

Rasmussen's process research further emphasizes the emergence of university spin-off ventures over time, while Rasmussen, Mosey, and Wright show that entrepreneurial competencies are developed through interactions between researchers and external or institutional resources. Their departmental study demonstrates that university context can influence the speed and character of competency development. Readiness is consequently developmental, cumulative, and institutionally embedded.

3.2 Team Heterogeneity and Entrepreneurial Capability

Multidisciplinary research teams can provide a strong knowledge foundation for technology-based entrepreneurship because commercialization often requires the integration of several technical and application domains. Nevertheless, research on academic spin-out teams indicates that heterogeneous expertise needs coordination. Vanaelst and colleagues followed teams across different stages of spin-out development and found that team composition and strategic orientation evolved as ventures progressed. Their findings suggest that commercial milestones can require the addition or reconfiguration of competencies that were not central to the originating research project.

The distinction between technical and entrepreneurial capability is particularly important. A research group may contain highly accomplished scientists while lacking competence in customer discovery, business-model development, fundraising, regulatory strategy, pricing, sales, venture governance, or external partnership development. Thomas and colleagues' pre-formation study explicitly focuses on entrepreneurial capabilities for scientist-entrepreneurs, reinforcing the value of developing venture capabilities before company formation.

Multidisciplinary diversity can also produce integration costs. Different scientific fields may define evidence differently, use distinct methodological standards, and value different development outcomes. A clinical researcher may prioritize safety and patient benefit, an engineer may emphasize technical performance, a software scientist may prioritize scalability, and a business-oriented member may emphasize customer adoption and economic feasibility. None of these priorities is inherently inappropriate, but commercialization requires mechanisms for reconciling them into shared decisions.

For this reason, the present framework defines multidisciplinary team readiness through role clarity, shared commercialization goals, decision processes, interdisciplinary communication, complementary entrepreneurial capability, and conflict resolution. Scientific diversity becomes a commercialization asset only when the team can convert dispersed expertise into coordinated venture action.

3.3 Technology, Market, Intellectual Property, and University Support

A technically advanced invention is not automatically a viable spin-off opportunity. Vohora and colleagues' developmental model and the wider university spin-off literature emphasize that technological opportunity must eventually be connected with a credible value proposition, resources, market legitimacy, and entrepreneurial commitment. Market understanding therefore needs to develop alongside technological validation rather than being postponed until after company incorporation.

Intellectual-property readiness is similarly important. A spin-off may depend on university-owned patents, jointly developed inventions, background intellectual property, software rights, research sponsor agreements, or licenses involving several inventors and departments. Lack of clarity concerning ownership, exclusivity, or freedom to commercialize can create substantial uncertainty for both founders and potential investors. Institutional commercialization arrangements must therefore be assessed before the team assumes that scientific authorship equates to unrestricted commercial ownership.

University support can partially reduce these barriers. Technology-transfer offices, commercialization advisers, incubators, proof-of-concept funds, entrepreneur-in-residence programs, industry networks, and venture-development programs can provide expertise that multidisciplinary scientific teams do not possess internally. Rasmussen, Mosey, and Wright show that university

departments influence entrepreneurial competency development, while Thomas and colleagues demonstrate the importance of capability development before spin-off formation.

However, institutional support should not become an automatic push toward company formation. Calderón-Hernández and colleagues identify institutional barriers affecting university spin-off creation, and Sandström and colleagues' review of academic-entrepreneurship policy initiatives cautions that commercialization-support mechanisms should be assessed critically rather than assumed to generate venture success automatically. A readiness framework is therefore useful precisely because it can identify when licensing, further research, partnership, or abandonment may be more defensible than immediate spin-off formation.

4. Research Methodology

4.1 Research Design and Simulation Architecture

The study adopts a simulation-based explanatory design because no empirical university-commercialization dataset was supplied. No real research team, patent portfolio, technology-transfer record, investor assessment, commercialization project, or spin-off company is represented in the numerical analysis. The simulation is intended to operationalize the proposed framework transparently rather than generate artificial empirical evidence.

Five multidisciplinary commercialization-capability scenarios were constructed at maturity levels of 20%, 40%, 60%, 80%, and 100%. The lowest condition represents a scientifically oriented team in which technology development is substantial but commercialization responsibilities remain fragmented. Intermediate conditions progressively introduce market discovery, intellectual-property preparation, entrepreneurial competence, formal team roles, and institutional commercialization support. The highest condition represents a mature pre-spin-off team but does not imply that every uncertainty has been eliminated.

Each maturity condition is interpreted as an analytical configuration rather than a chronological stage that every project must follow mechanically. A team could, for example, possess mature technology but weak market validation, or strong entrepreneurial leadership but unresolved intellectual property. The aggregate scenarios are used only to demonstrate how balanced capability development could influence readiness.

No inferential statistical tests are reported. Synthetic scenarios cannot legitimately generate population-level p-values, confidence intervals, or causal effect estimates. Future empirical research should validate the framework using actual commercialization projects observed longitudinally from research disclosure through licensing, spin-off formation, or project discontinuation.

4.2 University Spin-Off Readiness Index for Multidisciplinary Teams

Technology and market validation receive the highest conceptual weights because a spin-off requires both a sufficiently credible technological proposition and evidence that the proposition addresses a meaningful external need. The remaining dimensions determine whether that opportunity can be legally controlled, entrepreneurially developed, organizationally coordinated, and institutionally supported.

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Table 1: Operationalization of University Spin-Off Readiness

Readiness Dimension	Weight	Operational Meaning	Illustrative Evidence
Technology Validation	0.20	Evidence that the research output functions reliably beyond an isolated experimental result	Repeatability, prototype verification, performance benchmark, technical-risk register
Market-Problem Validation	0.20	Evidence that a sufficiently important user or customer problem exists	Customer interviews, stakeholder validation, competing-solution analysis
Intellectual-Property Readiness	0.15	Clarity concerning ownership, protection, licensing, and commercialization rights	Invention disclosure, patent assessment, ownership review, licensing pathway
Entrepreneurial Capability	0.15	Ability to convert research outputs into a venture proposition and mobilize resources	Business-model capability, commercial leadership, financial and partnership competence
Multidisciplinary Team Integration	0.15	Capacity to convert disciplinary diversity into coordinated venture decisions	Shared milestones, role clarity, common terminology, conflict-resolution mechanisms
University Commercialization Support	0.15	Availability and effective use of institutional commercialization infrastructure	Technology-transfer support, incubation, proof-of-concept resources, mentor and investor access

Source: Author-developed simulation framework informed by university spin-off process research, entrepreneurial-team research, and pre-formation capability literature.

The index deliberately separates technological readiness from overall spin-off readiness. A research team could possess a technically mature prototype while remaining commercially unready because there is no validated customer need or because the intellectual-property pathway remains unresolved.

Similarly, multidisciplinary team integration is evaluated independently of team diversity. Adding additional disciplines does not automatically raise the score. Integration requires evidence that members understand how their expertise contributes to commercialization, that decision responsibility is sufficiently clear, and that disagreements can be resolved without repeatedly delaying venture development.

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4.3 Evaluation Measures and Simulated Scenario Procedure

Six outcome indicators were selected for the comparative analysis. Overall Spin-Off Readiness Index represents the combined six-dimensional score. Validated Customer-Problem Understanding reflects the proportion of critical market assumptions supported by structured external discovery. Intellectual-Property Preparedness represents the modeled degree to which ownership, protection, and licensing questions have been resolved.

Venture-Role Clarity measures whether scientific, technical, commercial, and governance responsibilities are understood by team members. Investor Readiness represents whether the proposed venture possesses a coherent technology, market, IP, team, and resource narrative suitable for preliminary external investment consideration. This measure does not indicate actual fundability.

Finally, commercialization-decision delay represents the number of weeks required for the team to reach a sufficiently informed decision to proceed toward spin-off formation, pursue an alternative transfer route, undertake further validation, or discontinue commercialization.

5. Analysis

5.1 Spin-Off Readiness Across Multidisciplinary Capability Levels

At low maturity, technical expertise may be present but remains disconnected from commercial decision making. The team may understand the science while lacking evidence concerning customers, intellectual-property control, entrepreneurial leadership, or venture responsibilities. Such a project can appear technologically promising and still be inappropriate for immediate spin-off formation.

At higher maturity, technical and disciplinary expertise is increasingly integrated with market discovery, IP preparation, commercial roles, and university support. This mirrors the process perspective identified by Vohora and colleagues and the capability-development perspective developed by Rasmussen, Mosey, and Wright.

Table 2: Simulated University Spin-Off Readiness Outcomes

Multidisciplinary Capability Maturity	Spin-Off Readiness Index	Validated Customer-Problem Understanding	IP Preparedness	Venture-Role Clarity	Investor Readiness	Commercialization-Decision Delay
20%	37	30%	42%	35%	24%	26 weeks
40%	51	45%	55%	49%	38%	21 weeks
60%	65	61%	69%	64%	54%	16 weeks
80%	78	75%	82%	79%	68%	11 weeks
100%	89	86%	92%	91%	81%	8 weeks

Note: All numerical values are simulated. They do not represent actual university researchers, intellectual-property portfolios, investors, commercialization programs, or spin-off companies.

5.2 Market, IP, and Entrepreneurial Translation

Validated customer-problem understanding rises from 30% to 86% across the modeled scenarios. This increase is important because university inventions often originate from scientific questions rather than customer-defined problems. Commercialization therefore requires translation between the technical logic of the research and the economic or societal problem for which customers, users, institutions, or partners may adopt the resulting solution.

The model does not assume that market validation should alter scientific results or encourage premature market conformity. Instead, external discovery helps determine whether an independent company represents an appropriate transfer mechanism. A technology may be technically important yet address a market too small for venture formation, require development resources beyond the capability of a start-up, or be better transferred to an established firm through licensing.

IP preparedness rises from 42% to 92%. This variable has a particularly strong influence on commercialization credibility because investors and external entrepreneurs need clarity regarding what the spin-off will actually control. The research team must distinguish scientific contribution from ownership and identify university rights, background IP, inventor obligations, sponsor restrictions, patent strategy, and licensing conditions.

Investor readiness increases from 24% to 81%, but the highest scenario intentionally remains below complete readiness. This reflects the reality that pre-formation university ventures retain uncertainty even when their preparation is strong. Thomas and colleagues similarly emphasize entrepreneurial capability development before formal spin-off creation, while the wider academic-spin-off literature identifies continuing resource and growth challenges after incorporation.

5.3 Team Integration and Commercialization Decision Speed

Venture-role clarity increases from 35% in the fragmented scenario to 91% in the mature condition. This outcome is particularly important for multidisciplinary academic teams because scientific authorship, project leadership, inventorship, and venture leadership are not equivalent roles.

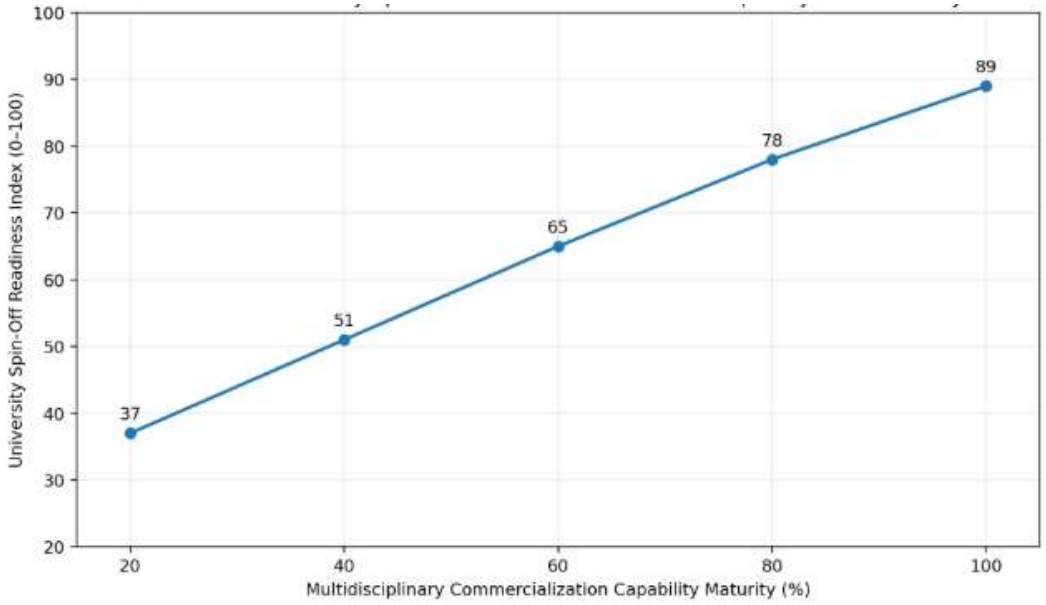
A principal investigator may remain scientifically central while another individual becomes chief executive. An engineer may lead product development while a clinical researcher leads validation. A nonacademic commercial founder may become responsible for fundraising and market development. Clarifying these arrangements early can reduce conflict and prevent every venture decision from being negotiated from first principles.

Vanaelst and colleagues' research supports this dynamic interpretation of academic entrepreneurial teams by showing that composition and strategic orientation change as spin-outs move through developmental stages. The mature team should therefore be understood as an adaptive configuration rather than a fixed group of researchers whose original project roles remain unchanged after commercialization begins.

The simulated commercialization-decision delay decreases from 26 weeks to 8 weeks. This does not mean that responsible teams should rush incorporation. Rather, structured readiness work reduces

avoidable delay caused by repeatedly reopening unresolved questions concerning market need, IP ownership, leadership, or institutional approvals.

Graph 1: Simulated University Spin-Off Readiness Across Multidisciplinary Team Maturity



Interpretation: The line graph illustrates a progressive increase in simulated spin-off readiness as multidisciplinary research teams develop stronger commercialization capabilities. The relationship is a theoretical scenario construction rather than an empirically estimated causal association.

Key finding: Multidisciplinary scientific capability becomes commercially valuable when technological evidence, customer understanding, IP clarity, entrepreneurial competence, team integration, and university commercialization support mature together.

6. Discussion

6.1 Multidisciplinarity Creates Potential, Not Automatic Venture Readiness

The first major implication of the study is that multidisciplinary composition should not be treated as an unconditional advantage. A team combining engineering, life science, data science, design, and management may possess greater collective knowledge than a single-discipline research group, but commercialization requires that the knowledge be integrated around a common venture proposition.

Vanaelst and colleagues provide important evidence that academic entrepreneurial teams evolve as spin-outs advance and that team heterogeneity must be understood dynamically. This suggests that multidisciplinary teams may initially be optimized for research generation rather than venture execution. Commercialization can require the addition of business expertise, regulatory knowledge, product-development capability, experienced entrepreneurial leadership, or external industry networks.

The management challenge is therefore integration without intellectual homogenization. Spin-off readiness does not require researchers to abandon disciplinary perspectives. Clinical, engineering, legal, and commercial specialists should continue to evaluate the venture using their relevant professional standards. What is required is an agreed mechanism for translating those perspectives into decisions

concerning development priorities, product requirements, risk, resource allocation, and commercialization milestones.

A multidisciplinary team becomes strategically valuable when disagreement produces stronger evaluation rather than permanent paralysis. Shared evidence standards, defined decision rights, clear milestone ownership, documented assumptions, and a common commercialization vocabulary can help transform disciplinary plurality into venture capability.

6.2 Spin-Off Readiness Requires Parallel Technology and Market Learning

The second implication is that university commercialization should avoid a purely sequential model in which research is fully completed before market learning begins. Scientific development and commercial discovery can inform one another without compromising research integrity. Early customer or user engagement can reveal which technical performance characteristics matter most in actual adoption contexts and which features may be scientifically interesting but commercially peripheral.

This does not mean that university research should be subordinated to immediate market demand. Some technologies require substantial fundamental development before customers can evaluate a realistic solution. The readiness framework therefore supports parallel learning rather than premature selling. Technical experiments reduce scientific uncertainty while stakeholder discovery reduces adoption uncertainty.

Vohora and colleagues' process perspective demonstrates that university spin-outs must cross several developmental junctures rather than simply advance from invention to company formation. Rasmussen, Mosey, and Wright similarly show that entrepreneurial competencies emerge through interaction and resource mobilization over time. These findings support evaluating readiness through accumulated evidence rather than through a single commercialization decision.

Intellectual property should also be developed in parallel. Delaying ownership and licensing discussions until an investor becomes interested can create unnecessary uncertainty. Conversely, patent filing should not be interpreted as confirmation of market demand. Technology validation, market learning, and IP strategy answer different questions and should remain analytically separate.

6.3 University Support Should Enable Better Commercialization Decisions, Not More Spin-Offs at Any Cost

The third implication concerns the role of universities. Universities may understandably value spin-off numbers as visible indicators of entrepreneurship and knowledge transfer, but the number of companies formed is an incomplete indicator of successful commercialization. Mathisen and Rasmussen's critical review emphasizes the importance of examining development, growth, and performance after spin-off creation rather than concentrating only on formation antecedents.

An effective commercialization system should therefore improve the quality of pathway selection. Some multidisciplinary research teams should become spin-offs. Others should license technologies to established companies, form strategic development partnerships, pursue further proof-of-concept research, release appropriate innovations openly, or discontinue a commercialization path that lacks sufficient technical or economic justification.

Thomas and colleagues' emphasis on pre-formation entrepreneurial capability supports this perspective because institutional assistance can help researchers determine what capabilities remain absent before organizational formation. Rasmussen, Mosey, and Wright further demonstrate that departmental context can shape entrepreneurial capability development. Universities therefore influence not only the number of ventures created but also whether research teams enter commercialization with realistic preparation.

The proposed USRI-MRT can serve as a stage-gate discussion framework rather than an automatic scoring mechanism. A low aggregate score should not automatically terminate commercialization, and a high score should not guarantee incorporation. More useful is the pattern across dimensions. A team with high technology readiness but weak commercial leadership needs a different intervention from a team with excellent market evidence but unresolved IP ownership.

7. Conclusion

Multidisciplinary university research teams are increasingly important sources of knowledge-intensive innovation because complex technological problems often require expertise crossing traditional disciplinary boundaries. However, the capabilities that generate strong academic research are not identical to those required for independent venture creation. Scientific breadth can create valuable commercialization options, but it can also introduce role ambiguity, communication differences, intellectual-property complexity, and competing interpretations of technological and market priorities.

This study developed the University Spin-Off Readiness Index for Multidisciplinary Research Teams around six interconnected dimensions: technology validation, market-problem validation, intellectual-property readiness, entrepreneurial capability, multidisciplinary team integration, and university commercialization support. The framework treats spin-off readiness as a pre-formation organizational capability rather than as a binary characteristic inferred from patent ownership, prototype completion, or incorporation.

The simulation illustrates the internal logic of the framework. Overall readiness increases from 37 to 89 across the five synthetic multidisciplinary-capability conditions. Customer-problem validation, IP preparedness, role clarity, and investor readiness improve simultaneously, while commercialization-decision delay declines. These findings are not empirical estimates. They represent theoretically structured scenarios designed to make the proposed readiness construct transparent and suitable for subsequent validation.

The analysis also indicates that multidisciplinary diversity should be evaluated through integration rather than headcount. Teams become venture ready when disciplinary expertise can be translated into shared technological milestones, market propositions, ownership arrangements, entrepreneurial roles, and resource decisions. Where commercial capabilities are missing, the appropriate response may be to add external entrepreneurial expertise rather than expecting academic researchers to assume every venture role themselves.

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