University of Management and Technology

UMT Prioritized Research Clusters Framework

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1 Overview

The Prioritized Research Clusters Framework (PRCF) is established as the strategic backbone for the operationalization of Pillar 3 (Research, Innovation, and Knowledge Impact) within UMT's StratPlan 2035. The framework is designed to strengthen UMT's research excellence, societal and industrial impact, external funding, international visibility, and contribution to relevant global ranking indicators, including UMT's aspiration to secure a position among the Top 200 in the QS Asia Rankings and the Top 100 in the Times Higher Education (THE) Impact Rankings. Achieving these milestones requires a deliberate institutional shift from a traditional publication-driven culture characterized primarily by volume-based metrics toward an impact-oriented research ecosystem. This transition prioritizes useful knowledge, solutions, technologies, policy contributions, and other research outputs that address high-impact societal problems and national priorities. By establishing formalized research clusters, UMT transforms research from fragmented, individual-driven efforts into a coordinated, system-level institutional process and focuses institutional resources on thematic domains where UMT possesses competitive strengths and strong potential for research excellence, societal impact, external funding, and international visibility.

2 Objective

Clear objectives are critical to preventing fragmentation of research efforts and ensuring that academic output remains aligned with institutional priorities, national needs, and the United Nations Sustainable Development Goals (SDGs). This framework serves as the primary instrument for sequencing institutional tasks, defining actionable mandates, and assessing the resource requirements needed for multi-year execution. The core objectives of the PRCF are to:

a. Operationalize Priority Research Themes: Define and activate specific research clusters mapped to UMT's strategic strengths and the Pillar 3 Workplan.

b. Align Institutional Strengths with SDGs: Ensure every research group contributes to specific, measurable global outcomes (SDGs 1–17).

c. Define Mandates and Leadership: Establish clear jurisdictional boundaries and leadership roles to foster interdisciplinary synergy while eliminating academic silos.

d. Establish Governance and Coordination: Implement standardized "Cadence of Accountability" mechanisms for centralized monitoring and synchronization.

This framework moves UMT beyond the ad hoc production of academic papers toward a solution-oriented model. It transforms research from an individual pursuit into a predictable institutional process and promotes a wider portfolio of outputs, including high-quality publications, competitive grants, patents and intellectual property, prototypes and technologies, policy briefs, industry solutions, datasets and software, start-ups, community interventions, and other demonstrable forms of societal and economic impact.

3 Scope

The jurisdictional boundaries of this framework are institution-wide, ensuring that research impact is a shared responsibility across academic and professional units. This framework applies to all academic schools, departments, research centers, faculty members, MS/MPhil and PhD researchers, relevant University Management Offices (UMOs), including ORIC, and other institutional units contributing to research, innovation, commercialization, external engagement, and research impact.

4 Definitions

For the purpose of this framework, the following definitions shall apply:

a. **Prioritized Research Cluster:** A university-level, interdisciplinary thematic platform approved by the Research Steering Committee (RSC) to coordinate research around a defined strategic problem or opportunity.

b. **Research Group**: A disciplinary or thematic working unit that may operate within, contribute to, or be affiliated with an approved Prioritized Research Cluster.

c. **Cluster Lead:** A senior faculty member appointed to provide strategic direction, coordinate implementation, and report performance of an approved cluster.

d. **Research Steering Committee (RSC):** The central institutional body responsible for approval, oversight, coordination, performance review, and strategic alignment of the Prioritized Research Clusters (chaired by Provost).

e. **Interdisciplinary Research:** Research that integrates knowledge, methods, or expertise from two or more disciplines, schools, departments, or professional domains.

f. **Annual Strategic Validation:** The institutional review process through which cluster performance, KPIs, strategic relevance, funding priorities, and continuation are assessed annually.

5 Prioritized Research Clusters and Support Mechanisms

The framework is built upon a tiered, pyramid-based engagement model to promote sustainable research capacity, succession, mentorship, interdisciplinary collaboration, and institutional continuity.

5.1 Research Engagement Pyramid

Every sanctioned Prioritized Research Cluster shall maintain the following engagement structure to ensure quality oversight, mentorship, interdisciplinary participation, external linkage, and a sustainable talent pipeline:

Stakeholder Group	Requirement/Role
International Collaborators	Joint publications, multinational grant applications, and advisory engagement.
National Collaborators	Partners from local industry, government agencies, or other Pakistani universities.
Cross-Disciplinary UMT Faculty	Mandatory inclusion of at least one member from a different UMT School/Department.
Department Faculty	2–3 core members; must include at least one Senior Faculty Lead for quality oversight.
BS/MS/PhD Students & Alumni	Active contributors serving as Research Assistants (RAs) and the talent pipeline.

5.2 Priority Research Domains

UMT has identified seven Prioritized Research Clusters aligned with StratPlan 2035. These clusters are mandated to address specific high-impact problems and may be periodically refined through Annual Strategic Validation in response to institutional strengths, national priorities, funding opportunities, and emerging research needs:

a. **Clean Energy & Water Sustainability:** Addressing energy insecurity and water scarcity, Li-ion batteries and water splitting, Solar-assisted polygeneration etc. SDGs 6, 7, 13.

b. **Smart Agriculture & Food Systems:** Combating post-harvest losses and malnutrition through functional foods and genome profiling. SDGs 2, 3, 12.

c. **Digital Transformation & AI for Social Good:** Improving inefficient public services via blockchain supply chains and predictive modeling in healthcare. SDGs 9, 10, 11.

d. **Health Innovations & Systems Strengthening:** Addressing communicable diseases (Virology: HCV/SARS-CoV-2) and affordable stroke rehabilitation apps. SDGs 3, 9.

e. **Social Innovation, Governance & Public Policy:** Tackling weak disaster management, flood risk perception, and workplace well-being. SDGs 1, 4, 16, 17.

f. **Resilient Cities & Climate Solutions:** Solving urban risks such as smog and flooding; developing recycled construction materials. SDGs 11, 13, 15.

g. **Advanced Materials & Industrial Innovation:** Reducing dependence on imported industrial materials through sustainable textiles and aerospace hybrid polymers. SDGs 8, 9.

6 Cluster Formation and Operationalization

6.1 Formation & Alignment

a. **Identification:** Mapping institutional strengths to priority domains.

b. **Alignment:** Deans map faculty via the Course Load Adjustment Formula (CLAF) to protect research time.

c. **Mandate:** Each approved cluster shall operate under an RSC-approved mandate defining its thematic scope, strategic objectives, priority research questions, three-year research agenda, membership and roles, expected outputs and outcomes, annual milestones and KPIs, external funding and collaboration targets, intended societal, industrial, policy, or academic impact, sustainability plan, resource requirements, and reporting responsibilities. The mandate shall guide monthly cluster work and may be refined through Annual Strategic Validation.

6.2 Cluster Eligibility and Composition Criteria

a. **Interdisciplinary Composition:** The proposed cluster shall normally include active faculty representation from at least two disciplines, departments, or schools, with at least one senior faculty member serving as Cluster Lead.

b. **Critical Mass:** The cluster shall demonstrate an adequate core team of active researchers, supported where appropriate by MS/MPhil/PhD students, research assistants, alumni, or postdoctoral researchers.

c. **Research Strength and Relevance:** The team shall demonstrate relevant research capability through publications, grants, patents, professional expertise, industry engagement, policy contribution, or other evidence appropriate to the field.

d. **Three-Year Research Agenda:** The cluster shall define priority research questions, expected outcomes, measurable milestones, external funding targets, and intended societal, industrial, policy, or academic impact.

e. **External Linkage:** Each cluster shall actively pursue national and/or international collaborators, industry partners, government agencies, funding bodies, or relevant community stakeholders.

f. **Strategic Alignment:** The cluster shall demonstrate clear alignment with UMT StratPlan 2035, Pillar 3 priorities, relevant SDGs, and national or international research priorities.

g. **Faculty Affiliation:** Membership in a Prioritized Research Cluster shall not replace a faculty member's departmental affiliation. Faculty may contribute to more than one cluster where their expertise is relevant; however, a primary cluster affiliation shall be identified for performance reporting and accountability purposes.

h. **Approved Cluster Composition:** Each cluster shall have a designated senior faculty Cluster Lead; two to three core departmental faculty members; at least one cross-disciplinary UMT faculty member; MS/MPhil/PhD students, research assistants, and alumni as appropriate; and national or international collaborators, industry, government, or community partners relevant to the cluster mandate. Membership shall be reviewed periodically to maintain an active, interdisciplinary, and delivery-focused team.

6.3 Governance

a. **Cluster-Level Monthly Progress Review:** Each Prioritized Research Cluster shall hold a mandatory monthly meeting, chaired by the Cluster Lead, to review progress against its approved mandate, annual milestones, research outputs, grant pipeline, collaborations, risks, resource needs, and corrective actions. A concise monthly progress update shall be prepared for submission to the RSC Secretariat.

b. **RSC Quarterly Cluster Review:** The Research Steering Committee shall review consolidated progress of all seven Prioritized Research Clusters at least quarterly. The review shall assess performance against approved mandates and KPIs, resolve cross-cluster or institutional issues, identify funding and collaboration opportunities, and direct corrective or enabling actions where required.

c. **Documentation:** Official minutes of each monthly cluster meeting and each quarterly RSC review, together with action owners and timelines, are required for follow-up, institutional memory, performance evidence, and audit purposes.

d. **Visibility:** Every approved cluster shall maintain an updated institutional web profile detailing its focus, leadership, members, SDGs, major outputs, grants, collaborations, and high-impact publications.

e. **RSC Composition:** The RSC shall be chaired by the Provost or another senior academic leader designated by the competent authority and shall include relevant Deans, the Dean ORIC, selected senior research faculty/Cluster Leads, and co-opted external experts where required.

f. **Meeting Frequency and Quorum:** Each cluster shall meet monthly. The RSC shall meet at least quarterly to review consolidated progress of all seven clusters. RSC quorum shall normally consist of a simple majority of members, including the Chair or the Chair's nominee.

g. **Adaptive Sub-Clusters:** Specialized sub-clusters may be formed for time-bound projects, niche grant calls, emerging research areas, or cross-cluster initiatives, subject to reporting through the parent cluster.

7 Roles and Responsibilities

To ensure effective governance and seamless interdisciplinary integration, the Research Steering Committee (RSC) shall provide institutional oversight while Cluster Leads coordinate implementation at the thematic level. The RSC shall include relevant academic and research leadership, ensuring that strategic, administrative, and disciplinary perspectives are represented. Deans shall act as Strategic Liaisons by mapping faculty and student expertise to cluster goals, while the interdisciplinary structure shall leverage existing UMT Research Groups and external collaborators to bridge local expertise with national and international research networks. Cluster Leads shall normally be appointed for a three-year term based on demonstrated research leadership, interdisciplinary engagement, external funding potential, and alignment with the cluster mandate, with performance reviewed annually by the RSC.

Role	Responsibility
Research Steering Committee (RSC)	Approves and oversees all seven Prioritized Research Clusters; conducts quarterly consolidated performance reviews and annual strategic validation.
School Deans	Act as Strategic Liaisons between schools and the RSC; map faculty and student expertise to clusters, facilitate interdisciplinary participation, and support delivery of cluster commitments.
RSC Secretary (Rotating)	Coordinates RSC meetings; consolidates monthly cluster updates; maintains records and tracks follow-up; and supports RSC decisions. The role may rotate among designated senior academic members.
Cluster Lead (Senior Faculty)	Provides strategic direction; coordinates the three-year agenda; convenes and documents monthly progress reviews; monitors annual targets; develops external linkages; submits monthly updates; and is accountable for cluster performance. Normally appointed for a three-year term, subject to annual review.
Research Assistants (RAs) and Research Students	MS/MPhil/PhD students, research assistants, alumni, and other trainees who contribute to cluster projects and form the research talent pipeline.
RSC Chair	Provides strategic leadership to the RSC, approves meeting agendas, ensures alignment with StratPlan 2035 and Pillar 3, and escalates major decisions to the competent authority where required.
Dean ORIC	Supports external grants, industry linkages, innovation, commercialization, intellectual property, research visibility, and coordination of relevant ORIC services for cluster activities.

8 Performance Monitoring and KPIs

The assessment of research impact shall be governed by Annual Strategic Validation, an institutional strategic review forum led by the Rector, Provost and Vice Provost Research, with participation of the Research Steering Committee (RSC) and other relevant stakeholders. The forum may define, review, and adjust annual numerical targets for each Prioritized Research Cluster to remain responsive to national funding shifts, disciplinary norms, and international research and ranking indicators. Each cluster shall maintain a monthly Cadence of Accountability through documented progress reviews led by its Cluster Lead. The RSC shall use the consolidated monthly updates

to conduct a quarterly review of all seven clusters, monitoring implementation progress, milestones, KPIs, risks, deliverables, funding opportunities, resource constraints, and corrective actions. Monthly cluster minutes and quarterly RSC review records shall serve as primary evidence for institutional follow-up, annual validation, and audit purposes.

8.1 Minimum KPI Basket

Annual numerical targets may vary by discipline and cluster; however, performance assessment shall draw from an appropriate combination of the following indicators:

a. **Research Quality and Publications:** Q1/top-tier or other discipline-appropriate high-quality outputs, including interdisciplinary publications and high-impact scholarly work.

b. **Citation and Research Influence:** Citation impact, field-normalized influence where available, high-impact cited outputs, and research visibility.

c. **External Funding:** Competitive grant submissions, success rate, external grant income, and participation in national/international funded consortia.

d. **Innovation and Translation:** Patents, intellectual property, prototypes, technologies, software, datasets, start-ups, commercialization, standards, and industry solutions where applicable.

e. **Societal and Policy Impact:** Policy briefs, government or community engagement, SDG-linked interventions, evidence of adoption, and measurable societal benefit.

f. **Collaboration and Capacity Building:** National/international collaborations, industry/government partnerships, postgraduate researchers, research assistants, mentoring, and interdisciplinary participation.

g. **Visibility and Strategic Contribution:** International profile, invited engagement, research communication, cluster web presence, and contribution to relevant institutional and global ranking indicators.

9 Seed Funding Support

To promote the development of high-impact interdisciplinary research ecosystems, UMT may provide competitive seed funding support of up to PKR 2 Million (extendable depending upon the demand justification) to each of the approved Prioritized Research Cluster during the initial phase (per funding cycle), subject to availability of budget and approval by the competent authority. Approval of a cluster shall not automatically create entitlement to seed funding. Funding shall be awarded competitively on the basis of a formal proposal outlining research objectives, strategic relevance, expected outcomes, measurable milestones, sustainability plan, budget, external funding pathway, and alignment with UMT StratPlan 2035 and relevant SDGs. Seed funding may support pilot studies, research infrastructure or shared resources, collaborative activities, proposal development for external grants, graduate student engagement, and innovation-driven initiatives in accordance with university financial rules. Funding may be released against approved milestones, and each funded cluster shall submit utilization and outcome reports. Unspent funds shall be treated in accordance with university financial regulations. Continued institutional support shall be linked with demonstrated progress, performance outcomes, and potential for sustainability or external funding.

10 Continuation, Restructuring and Closure

Based on Annual Strategic Validation, the RSC may recommend continuation, restructuring, merger, suspension, or closure of a Prioritized Research Cluster. Such recommendations shall consider strategic relevance, achievement of agreed milestones, research quality, external funding performance, interdisciplinary engagement, societal/industrial impact, sustainability, and responsible utilization of institutional support. A cluster that consistently fails to demonstrate progress may be required to submit a corrective action plan within a defined period before further institutional support is considered.

11 Framework Review and Sustainability

This framework shall be reviewed at least every three years, or earlier where required, to ensure responsiveness to faculty needs, institutional priorities, national and international funding trends, research integrity expectations, and relevant ranking or benchmarking frameworks. Annual Strategic Validation shall be led by the Rector and Vice Provost Research, with support from the RSC, to ensure continued alignment with UMT StratPlan 2035 and to recommend any necessary adjustments to cluster priorities, KPIs, governance, or support mechanisms.

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