Detailed Budget Justification

ICMR First-in-World Challenge (FIWC) Grant Proposal

Principal Investigator: Dr. [Name] | Institution: [Institution]

Date: [Current Date] | Grant Category: FIWC - First-in-World Innovation

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Detailed Budget Justification

ICMR FIWC Grant: Autonomous Research Automation System

\*\*Total Budget Requested\*\*: ₹2,73,00,000

\*\*Project Duration\*\*: 36 months (September 2024 - September 2027)

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Executive Summary of Budget Allocation

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| Category | Amount (₹) | Percentage |
| Personnel | 1,73,00,000 | 63.4% |
| Equipment & Infrastructure | 75,00,000 | 27.5% |
| Operations & Other | 25,00,000 | 9.1% |
| \*\*Total\*\* | \*\*2,73,00,000\*\* | \*\*100%\*\* |

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1. Personnel Costs: ₹1,73,00,000 (63.4%)

1.1 Technical Core Team (₹85,00,000 over 36 months)

\*\*Justification\*\*: Development of the autonomous research system requires highly specialized technical expertise in AI/ML, biomedical informatics, and systematic review methodology.

**Artificial Intelligence/Machine Learning Specialists (5 personnel - ₹15,00,000)**

\*\*Experience Level\*\*: PhD in Computer Science/AI with 5+ years biomedical applications

\*\*Role\*\*: Development of NLP models, training classifiers, implementing ML pipelines

\*\*Market Rate\*\*: ₹35,000/month × 12 months × 5 personnel = ₹21,00,000/year

\*\*Total\*\*: ₹63,00,000 for 36 months

\*\*Justification for Salary\*\*: Specializes in biomedical NLP requiring domain expertise beyond standard ML skills

**Software Engineers (6 personnel - ₹20,00,000)**

\*\*Experience Level\*\*: ME/MTech Computer Science with 3+ years experience

\*\*Role\*\*: System architecture, API development, cloud deployment, quality assurance

\*\*Market Rate\*\*: ₹25,000/month × 12 months × 6 personnel = ₹18,00,000/year

\*\*Total\*\*: ₹54,00,000 for 36 months

**Data Scientists (4 personnel - ₹12,00,000)**

\*\*Experience Level\*\*: MSc Statistics/Bioinformatics with research experience

\*\*Role\*\*: Statistical modeling, data processing pipelines, validation framework

\*\*Market Rate\*\*: ₹20,000/month × 12 months × 4 personnel = ₹9,60,000/year

\*\*Total\*\*: ₹28,80,000 for 36 months

**Clinical Researchers (3 personnel - ₹15,00,000)**

\*\*Experience Level\*\*: MD/PhD with systematic review expertise

\*\*Role\*\*: Clinical expertise, literature evaluation, quality assessment

\*\*Market Rate\*\*: ₹35,000/month × 12 months × 3 personnel = ₹12,60,000/year

\*\*Total\*\*: ₹37,80,000 for 36 months

\*\*Premium Justification\*\*: Requires qualified medical professionals for clinical validity

**Biostatisticians (3 personnel - ₹12,00,000)**

\*\*Experience Level\*\*: MSc Biostatistics, MSc Epidemiology

\*\*Role\*\*: Meta-analysis methods, statistical validation, heterogeneity assessment

\*\*Market Rate\*\*: ₹20,000/month × 12 months × 3 personnel = ₹7,20,000/year

\*\*Total\*\*: ₹21,60,000 for 36 months

**UI/UX Developer (1 personnel - ₹3,00,000)**

\*\*Experience Level\*\*: UI/UX specialist for healthcare software

\*\*Role\*\*: User interface design for research platform

\*\*Market Rate\*\*: ₹25,000/month × 12 months × 1 = ₹3,00,000/year

**DevOps Engineer (1 personnel - ₹3,00,000)**

\*\*Experience Level\*\*: Cloud infrastructure specialist

\*\*Role\*\*: Cloud deployment, scaling, monitoring

\*\*Market Rate\*\*: ₹25,000/month × 12 months × 1 = ₹3,00,000/year

**Quality Assurance Specialist (1 personnel - ₹3,00,000)**

\*\*Experience Level\*\*: Software testing specialist

\*\*Role\*\*: Automated testing, validation framework

\*\*Market Rate\*\*: ₹25,000/month × 12 months × 1 = ₹3,00,000/year

1.2 Administrative and Support Staff (₹35,00,000)

\*\*Project Manager\*\* (1): ₹5,00,000 - Oversees entire project execution

\*\*Administrative Assistant\*\* (1): ₹3,00,000 - Documentation, coordination

\*\*HR Specialist\*\* (1): ₹4,00,000 - Recruitment, team management

\*\*Finance Officer\*\* (1): ₹3,00,000 - Budget tracking, financial reporting

\*\*Legal/Regulatory Specialist\*\* (1): ₹5,00,000 - Compliance, IP protection

\*\*Business Development Manager\*\* (1): ₹4,00,000 - Market research, partnerships

\*\*Communications Specialist\*\* (1): ₹3,00,000 - Stakeholder engagement, reporting

\*\*Office Support\*\* (1): ₹2,00,000 - Administrative support

1.3 Training and Professional Development (₹23,00,000)

\*\*Advanced AI Training\*\*: ₹8,00,000 - Specialized biomedical AI workshops

\*\*International Conferences\*\*: ₹10,00,000 - Presentation of research findings

\*\*Certification Programs\*\*: ₹5,00,000 - GCP, ethical AI, regulatory compliance

1.4 Consultants and External Expertise (₹30,00,000)

\*\*Regulatory Consultants\*\*: ₹10,00,000 - CDSCO and ICMR compliance guidance

\*\*IP Legal Experts\*\*: ₹8,00,000 - Patent filing and protection strategy

\*\*Clinical Trial Experts\*\*: ₹6,00,000 - Validation study design consultation

\*\*Industry Advisors\*\*: ₹6,00,000 - Pharmaceutical and research organization input

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2. Equipment and Infrastructure: ₹75,00,000 (27.5%)

2.1 High-Performance Computing Resources (₹35,00,000)

\*\*Justification\*\*: AI model training and large-scale biomedical data processing requires substantial computational resources beyond standard systems.

\*\*GPU Computing Cluster\*\*: ₹20,00,000

4× NVIDIA A100 GPUs (96GB each) for AI model training

Justified: Required for training large language models on biomedical literature

\*\*High-Performance CPU Servers\*\*: ₹10,00,000

128-core servers for parallel data processing

Justified: Systematic review processing of thousands of articles

\*\*Storage Solutions\*\*: ₹5,00,000

100TB enterprise-grade SSD storage for datasets

Justified: Biomedical literature corpus and training data

2.2 Cloud Infrastructure (₹20,00,000)

\*\*Justification\*\*: Scalable deployment and global accessibility require robust cloud architecture.

\*\*AWS/Google Cloud Setup\*\*: ₹15,00,000

3-year hosting, compute instances, database services

Justified: Pilot deployment and prototyping needs

\*\*CDN and Global Distribution\*\*: ₹5,00,000

Content delivery network for international access

Justified: Global research collaboration requirements

2.3 Software Licenses and Development Tools (₹10,00,000)

\*\*AI Development Platforms\*\*: ₹4,00,000 (PyTorch, TensorFlow Enterprise)

\*\*Biomedical Databases\*\*: ₹3,00,000 (PubMed API, Web of Science, Embase)

\*\*Development Tools\*\*: ₹2,00,000 (IDEs, collaboration platforms, CI/CD)

\*\*Security Tools\*\*: ₹1,00,000 (Code signing, vulnerability scanning)

2.4 Laboratory and Office Equipment (₹10,00,000)

\*\*High-End Workstations\*\*: ₹5,00,000 (16GB+ RAM, GPUs for development)

\*\*Meeting and Collaboration Tools\*\*: ₹2,00,000 (Video conferencing, whiteboards)

\*\*Laboratory Equipment\*\*: ₹3,00,000 (Servers, networking, backup systems)

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3. Operational Costs: ₹25,00,000 (9.1%)

3.1 Regulatory Compliance and Approvals (₹8,00,000)

\*\*Justification\*\*: Healthcare AI system requires extensive regulatory validation.

\*\*Ethics Committee Applications\*\*: ₹3,00,000 - IEC/IRB submissions across institutions

\*\*CDSCO Registration\*\*: ₹2,00,000 - Medical device classification and approval

\*\*Data Privacy Compliance\*\*: ₹3,00,000 - GDPR, PDP compliance certifications

3.2 Intellectual Property Protection (₹7,00,000)

\*\*Patent Filings\*\*: ₹4,00,000 - Core algorithms and methodologies

\*\*Trademark Registration\*\*: ₹1,00,000 - Brand and product protection

\*\*IP Legal Services\*\*: ₹2,00,000 - Ongoing legal consultation

3.3 Marketing and Business Development (₹10,00,000)

\*\*Justification\*\*: Successful commercialization requires market presence and user acquisition.

\*\*Marketing Materials\*\*: ₹3,00,000 - Brochures, presentations, demonstration videos

\*\*Conference Participation\*\*: ₹4,00,000 - Medical technology and AI conferences

\*\*Market Research\*\*: ₹3,00,000 - Competitive analysis, user surveys

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Budget Justification Summary

Cost-Benefit Analysis

\*\*Return on Investment Projections\*\*:

\*\*Direct Cost Savings\*\*: 80-90% reduction in systematic review costs

\*\*Revenue Generation\*\*: ₹2,00,00,000 from licensing and commercialization (Phase 2)

\*\*Economic Impact\*\*: ₹500,00,00,000 in broader research cost savings nationally

\*\*Cost Realism\*\*:

\*\*Market Benchmarks\*\*: Salaries aligned with industry standards for specialized roles

\*\*Equipment Costs\*\*: Competitive pricing for required high-performance hardware

\*\*Phased Spending\*\*: Budget distributed across project phases to minimize risk

Value Proposition

\*\*Development Investment Returns\*\*:

1. \*\*Immediate Impact\*\*: First-in-world technology establishing Indian leadership

2. \*\*Economic Benefits\*\*: Significant cost reduction for biomedical research

3. \*\*Global Competitiveness\*\*: Export potential and international collaboration

4. \*\*Healthcare Advancement\*\*: Accelerated evidence-based medicine adoption

Budget Control Measures

\*\*Financial Oversight\*\*:

Monthly budget reviews and variance analysis

Phased funding release contingent on milestone achievement

External audit and financial monitoring

15% contingency fund for unexpected expenses

\*\*Cost Efficiency Strategies\*\*:

Open-source component utilization where appropriate

Cloud-based infrastructure reducing capital expenditure

Collaborative partnerships sharing development costs

Modular development allowing parallel team workflows

This comprehensive budget allocation ensures successful development, validation, and commercialization of India's first autonomous biomedical research automation system while maximizing scientific and economic impact.