**Requirements Definition for the Khumbu Integrated System**

**System Overview:** The Khumbu Integrated System consists of a central Web Application and an omnichannel AI Assistant. The AI Assistant automates member interaction, support, and operational workflows, while the Web Application provides a rich, self-service portal for detailed management, tracking, and exploration. Both components share a common backend, database, and security model.

**1. Functional Requirements**

**1.1 User Access, Authentication & Onboarding**

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| **ID** | **Requirement** | **Details** |
| **FR1** | Public Portal | Allow prospective members to view public information on savings, investment options, travel benefits, and community services. Enable travel expense calculations and personal budget input without login. |
| **FR2** | Secure Authentication | Enable secure login for members using protocols like OAuth 2.0 or JWT. Implement password recovery via email/SMS. |
| **FR3** | Role-Based Access Control | Customized dashboards and permission levels for members, committee members, and administrators. |
| **FR4** | **AI-Guided Onboarding** | WhatsApp/web walkthrough for new members: tier selection, KYC, document upload (ID, proof of address), and auto-approval if criteria met. |
| **FR5** | **Tier-Based Registration** | Auto-configure user experience and workflows based on selected membership tier (Savings/Investment/Wealth). |
| **FR6** | Digital Contracts | Generate digital contracts for electronic acceptance and secure storage in the user's profile. |
| **FR7** | **Onboarding Analytics** | Dashboard for admins showing sign-ups, drop-off points, and tier distribution. |

**1.2 Member Management & Operations**

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| **ID** | **Requirement** | **Details** |
| **FR8** | Profile Management | Members can update personal details, view profiles, and access membership history. |
| **FR9** | Bulk Member Operations | CSV/Excel import with validation for adding members. Bulk messaging to all members or subgroups. |
| **FR10** | Multi-Level Approval Workflows | Configurable workflows (e.g., chairperson + treasurer approval for large loans or withdrawals). |
| **FR11** | **Beneficiary Management & Tracking** | Add/remove beneficiaries with ID verification. Enforce payout rules (e.g., 50% to spouse). Generate reports. |
| **FR12** | Admin & Fine Automation | Auto-deduct fees and penalties from contributions. Members may challenge late fines through the AI. |
| **FR13** | Executive Payments | Auto-pay executives based on predefined KPIs. |
| **FR14** | Policy Enforcement | Advisory council sets policies; AI monitors and enforces compliance. |
| **FR15** | Task Automation | Assign committee tasks and send reminders (integrated with Trello/Slack/Azure DevOps). |
| **FR16** | Stokvel Transparency | All members can view group balance and audit history. |

**1.3 Finance, Savings & Investment Tracking**

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| **ID** | **Requirement** | **Details** |
| **FR17** | Contribution & Fee Tracking | Automatically calculate membership fees and track all contributions, loans, withdrawals, and interest. |
| **FR18** | Balances & Projections | Members can view savings balances, track investment portfolios, and project potential returns. |
| **FR19** | Investment Simulation | Members can simulate returns on different investment products (e.g., property, financial markets). |
| **FR20** | **Fund Withdrawals / Travel Vouchers** | Members submit withdrawal requests via WhatsApp/web. Requests are routed for executive approval. Upon approval, auto-payment is sent to linked accounts. Withdrawn funds are referred to as **"Travel Vouchers"**. Limits are configurable per stokvel. |
| **FR21** | Loan Management | Full lifecycle management: Application → approval → repayment → tracking → penalties. |
| **FR22** | Financial Statements | Generate monthly statements for savings, investments, and transactions (accessible in-portal and via WhatsApp/PDF). |
| **FR23** | Financial Reporting | Monthly/quarterly/yearly summaries and detailed financial reports (e.g., savings growth, travel expense gap, investment returns). Data is exportable as CSV/PDF. |

**1.4 Travel Expense & Management**

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| **ID** | **Requirement** | **Details** |
| **FR24** | Travel Expense Calculator | Input estimated costs for commuting, personal, and holiday travel. |
| **FR25** | Personal Budget & Savings Dashboard | Input monthly income and expenses to calculate travel costs. View **potential savings** and **actual savings** achieved through Khumbu initiatives. |
| **FR26** | Vehicle Listing & Trip Booking | Members can list vehicles for community trips (availability, capacity, destination). Members can view, request, and book trips. |
| **FR27** | Trip Negotiation | Members can negotiate trip costs with vehicle providers. |
| **FR28** | Travel Expense Gap | Calculate and display a personalized gap between actual travel expenses and savings/income from stokvel activities. |
| **FR29** | Travel Savings Tracking | Track and display individual travel expenses and a summary of actual savings. |

**1.5 Skills, Business Directory & Business Assist**

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| **ID** | **Requirement** | **Details** |
| **FR30** | Skills & Business Directory | Members can list their skills, services, or businesses for community engagement. |
| **FR31** | Service Requests & Exchanges | Members can request services from others within the stokvel, supporting internal transactions. |
| **FR32** | Income Tracking | Track and display income generated from internal services to promote transparency. |
| **FR33** | Ratings & Reviews | Implement a system for listed services to ensure quality. |
| **FR34** | **Business Assist** | Businesses (internal and external) indicate skills they **possess** or **require**. The system matches businesses needing resources with community members who can provide them (e.g., skills, expertise, financing). |

**1.6 Engagement, Communication & Analytics**

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| **ID** | **Requirement** | **Details** |
| **FR35** | Proactive Engagement | Weekly WhatsApp check-ins (satisfaction/mood). AI-generated personalized tips/encouragement. |
| **FR36** | Automated Reminders & Alerts | Contributions, deadlines, events (WhatsApp/SMS). Notifications for trip availability, savings growth, and investment updates (email/in-app). |
| **FR37** | Virtual Meetings | Auto-send calendar invites (Google Meet) for scheduled meetings. |
| **FR38** | Proposal Voting | Real-time tallying and sharing of results for group proposals. |
| **FR39** | Meeting Minutes | Voice-to-text transcription + attendance tracking. |
| **FR40** | Custom Reports | Generate savings/loans/participation stats and share via PDF/WhatsApp. |
| **FR41** | User Support & Feedback | Members can submit suggestions and report issues via the AI or web portal. Include a help page with FAQs and a support request form. |

**2. Non-Functional Requirements**

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| **ID** | **Requirement** | **Metric / Detail** |
| **NFR1** | Availability | 99.5% uptime or higher. |
| **NFR2** | Security | SSL/TLS encryption. POPIA/GDPR/KYC compliance. Multi-factor authentication for high-security areas. |
| **NFR3** | Compatibility | WhatsApp, Web (desktop, tablet, mobile), iOS, Android. |
| **NFR4** | Performance | <2s response time for queries. Pages load in under 2 seconds. |
| **NFR5** | Scalability | Support up to 1,000 concurrent users. Modular architecture to support growth. |
| **NFR6** | Data Protection | Encrypted storage (AES-256 at rest, SSL/TLS in transit). Daily automatic backups. |
| **NFR7** | API Support | RESTful APIs for full system integration (Web App <-> AI Assistant <-> External Services). |
| **NFR8** | Auto-Learning | AI improves via member feedback and interaction. |
| **NFR9** | Maintainability | Well-documented coding standards. Regular code reviews and performance testing. |
| **NFR10** | Usability | User-friendly, intuitive, and seamless navigation across all modules and devices. |

**3. Deployment & Integration**

* **Core Platform:** Python backend
* **Database:** MySQL (AES-256 encryption) or Postgress
* **Frontend:** Web Application (Responsive), Mobile Apps
* **Messaging:** WhatsApp Business API (Twilio)
* **KYC/OCR:** Google Vision API
* **Payments:** Stokvel bank account / PayFast integration
* **APIs:** RESTful architecture for all internal and external integrations.

**4. Key Unified Workflows**

1. **Onboarding:** Prospect uses public web calculator → Decides to join → AI guides them via WhatsApp to complete tier selection, KYC, and document upload → System auto-approves → Digital contract is signed → Member gains access to full web portal and AI.
2. **Withdrawal / Travel Voucher Request:** Member submits request via WhatsApp or Web → AI checks eligibility → Request routed for executive approval → Upon approval, auto-payment is sent to linked account → Transaction logged, and "Travel Voucher" is recorded.
3. **Beneficiary Payout:** Member adds beneficiary via AI/Web with ID verification → Payout rules are set → On triggering event (death/emergency), system verifies and triggers payout → Conflict resolution is escalated to advisory council.
4. **Business Assist Matchmaking:** An external business applies for a loan → Application requires them to list skills they possess and need → System matches them with internal community members who offer the required skills → Khumbulekhaya facilitates the connection as part of its support service.