## **Project Context: Crowdsource disaster relief app - *RushAlert app***

1. **Identify Collections:**

|  |  |
| --- | --- |
| **Collection** | **Purpose** |
| Users | Stores all user profiles: volunteers, donors, authorities. |
| Help Requests | For affected users to create SOS or support requests. |
| Donations | Tracks all donation activities (money, goods, etc.). |
| Volunteers | Tracks volunteer availability and assignments. |
| disasterAlerts | Stores geo-tagged alerts (push notifications). |
| messages | Secure chat messages between users. |
| updates | Real-time public user updates (crowdsourced timeline). |
| resources | Inventory of available relief items (for authorities). |
| analytics | Stores daily reports for authorities and dashboards. |
| feedbacks | Stores user feedback on operations or app experience. |

1. **Define Relationships:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **#** | **Relationship** | **Type** | **Description** | **Field**  **Reference** | **Model**  **Approach** | **Justification** |
| 1 | User – HelpRequest | One-to  -Many | A user can create multiple help requests. | helpRequests.userId → users.\_id | Referencing | Keeps help requests lightweight and user info normalized. |
| 2 | User – Donations | One-to-Many | A donor can make multiple donations. | Donations.  donorId → users.\_id | Referencing | Donation history grows large,referencing avoids duplication. |
| 3 | Volunteer – HelpRequest | Many-  to-  Many | Volunteers can be assigned to multiple help requests and vice versa. | volunteers.assigned  Requests → helpRequests.\_id | Referencing | Efficient assignment tracking denormalized if frequent lookup is needed. |
| 4 | User – Messages | One-to-Many | Users can send/receive multiple messages. | messages.  senderId / receiverId → users.\_id | Referencing | Messaging requires quick access referencing allows flexible user linking. |
| 5 | User – Updates | One-to-Many | Users can post multiple real-time updates. | updates.  userId → users.\_id | Referencing | Timeline updates are independent entities referencing simplifies ownership tracking. |
| 6 | Authority – Resources | One-to-Many | Authorities manage multiple resource inventories. | resources.  managedBy → users.\_id | Referencing | Keeps authority data centralized and avoids duplication in resource records. |
| 7 | Alert – Region | One-to-Many | One alert can target multiple regions via geospatial boundaries. | alerts.  geoLocation | Embedding | Geospatial queries need embedded location shapes for efficient spatial indexing. |
| 8 | Donation – Volunteer | Many-  to-One | A donation can be assigned to one volunteer for delivery. | donations.  deliveredBy → users.\_id | Referencing | Delivery assignment is singular referencing keeps the schema clean and manageable. |
| 9 | Feedback – User | One-to-One | Each feedback is given by a specific user. | feedbacks.  userId → users.\_id | Referencing | Feedbacks are optional and sparse referencing avoids bloating the user schema. |
| 10 | Analytics – Zones (Affected Areas) | Embedded | Daily analytics embed summary of affected zones. | analytics.  mostAffectedZones.  coordinates | Embedding | Analytics are read-heavy and don't require zone reusability embedding supports faster reads. |

1. **Sample Schemas**

1. **users**

{

"\_id": "8d2d134c-835b-486d-8585-39a75380e2fb",

"name": "User0",

"email": "user0@example.com",

"password": "hashed\_password",

"phone": "+91-900000000",

"role": "authority",

"location": {

"type": "Point",

"coordinates": [

80.2,

13.0

]

},

"language": "English",

"rewards": {

"points": 0,

"badges": [

"First Aid"

]

},

"createdAt": "2025-07-20T09:35:11.627928Z",

"updatedAt": "2025-07-20T09:35:11.627936Z"

},

1. **helprequests**

{

"\_id": "e5b62dd6-9350-4dd6-8c23-6b71cdfd799f",

"createdBy": "8d2d134c-835b-486d-8585-39a75380e2fb",

"title": "Help Request 0",

"description": "Urgent help needed",

"category": "medical",

"location": {

"type": "Point",

"coordinates": [

80.2,

13.0

]

},

"priority": "high",

"status": "open",

"createdAt": "2025-07-20T09:35:11.630218Z",

"updatedAt": "2025-07-20T09:35:11.630226Z"

}

1. **donations**

{

"\_id": "e78a2428-dfd8-41c2-a998-0a063ab8cd68",

"donorId": "fd877487-7128-4124-89d0-b43d4aa03cd0",

"type": "money",

"amount": 2291,

"items": [

"item1",

"item2"

],

"transactionId": "txn\_0",

"status": "delivered",

"deliveredBy": "307b1521-2ca7-430f-abd6-49f2f98b5bc5",

"createdAt": "2025-07-20T09:35:11.630764Z"

}

1. **volunteers**

{

"\_id": "615f1a2b3c4d5e6f7a8b9c0d",

"userId": "615f1a2b3c4d5e6f7a8b9c01",

"availability": true,

"assignedRequests": [

"615f1a2b3c4d5e6f7a8b9d00",

"615f1a2b3c4d5e6f7a8b9d01"

],

"currentLocation": {

"type": "Point",

"coordinates": [80.25, 13.05]

},

"gpsTrackingEnabled": true,

"lastUpdated": "2024-04-27T12:00:00Z"

},

1. **disaster alerts**

{

"\_id": "5b351274-dfe8-43e4-9e93-cdb693eaca84",

"type": "earthquake",

"source": "IMD",

"message": "Disaster Alert 0",

"severity": "critical",

"geoLocation": {

"type": "Polygon",

"coordinates": [

[

[

80.2,

13.0

],

[

80.3,

13.0

],

[

80.3,

13.1

],

[

80.2,

13.1

],

[

80.2,

13.0

]

]

]

},

"issuedAt": "2025-07-20T09:35:11.631336Z",

"expiresAt": "2025-07-20T09:35:11.631340Z"

}

1. **messages**

{

"\_id": "02d53739-fa96-4733-8339-34977982d95c",

"senderId": "3493b4e5-de13-404c-a676-450b51324ea3",

"receiverId": "cc2701af-1872-44f8-8acb-7b2a714db0ec",

"content": "Message content 0",

"timestamp": "2025-07-20T09:35:11.631684Z",

"read": false

}

1. **updates**

{

"\_id": "a6fd7d7d-111c-4cec-a57a-95c2dba16ea7",

"userId": "8d2d134c-835b-486d-8585-39a75380e2fb",

"message": "Update message 0",

"type": "availability",

"disasterType": "flood",

"verified": false,

"location": {

"type": "Point",

"coordinates": [

80.2,

13.0

]

},

"createdAt": "2025-07-20T09:35:11.631935Z"

}

1. **resources**

{

"\_id": "bb07e4f6-1311-4012-b4d6-1db5d204f02a",

"itemName": "Resource 0",

"category": "food",

"quantityAvailable": 75,

"storedAt": {

"coordinates": [

80.2,

13.0

],

"address": "Storage 0"

},

"managedBy": "18921d62-91c8-4bff-add8-eebf486dca01",

"lastUpdated": "2025-07-20T09:35:11.632242Z"

}

1. **analytics**

{

"\_id": "39871c07-b5fa-479b-9b7a-3ce47245f7be",

"date": "2025-07-20T09:35:11.632540Z",

"totalHelpRequests": 78,

"volunteersActive": 19,

"donationsSummary": {

"money": 39436,

"food": 447,

"clothes": 156

},

"mostAffectedZones": [

{

"coordinates": [

80.2,

13.0

],

"priority": "high"

}

]

}

1. **feedbacks**

{

"\_id": "b99ff0e1-094d-4cbd-b08f-cf5f071952ec",

"userId": "997c0a3a-7c95-41a1-8d35-6d3c36616808",

"feedback": "Feedback message 0",

"rating": 3,

"forModule": "donation",

"createdAt": "2025-07-20T09:35:11.633033Z"

}