5.3 Explore Feature

Feature Goal: Provide an interactive cosmic visualization interface for users to discover philosophical concepts through curiosity-driven exploration, build personalized concept constellations, and follow or create wisdom paths.

## System Architecture

### Frontend Components

- `ExploreScreen.tsx`: Main visualization interface with cosmic metaphor and interactive navigation.

- `ConceptDetail.tsx`: Detailed view of individual concepts with progressive revelation content.

- `PathNavigator.tsx`: Interface for browsing and following system and community wisdom paths.

- `ConstellationView.tsx`: Personalized view of user's explored concepts and connections.

- `CuriosityTrigger.tsx`: Animated "shooting star" components that present intriguing questions.

- `PathCreator.tsx`: Tool for users to create and share their own wisdom paths.

- `ConceptColorSystem.tsx`: Manages the color-coding system for concept types and relationships.

- `OrganicNudgeSystem.tsx`: Handles thought fragments, revelation echoes, and question seeds.

### Backend Components

- `explore\_service.py`: Core service managing concept relationships and exploration logic.

- `constellation\_manager.py`: Tracks and updates user's personal concept constellation.

- `path\_service.py`: Handles system-generated and user-created wisdom paths.

- `concept\_recommendation.py`: Generates personalized concept recommendations.

- `cross\_feature\_integration.py`: Manages connections with Quest, Ask, Journal, and Forum features.

- `organic\_nudge\_service.py`: Processes and delivers user-generated content nudges.

- `exploration\_analytics.py`: Tracks user exploration patterns and engagement metrics.

### Database Models

```sql

CREATE TABLE concepts (

id UUID PRIMARY KEY,

name VARCHAR(255) NOT NULL,

description TEXT NOT NULL,

plain\_language\_description TEXT NOT NULL,

academic\_description TEXT,

concept\_type VARCHAR(50) NOT NULL,

color\_code VARCHAR(7) NOT NULL,

domain\_id UUID REFERENCES concept\_domains(id),

created\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

updated\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP

);

```

Stores the core concept data including descriptions, type classification, and color coding.

```sql

CREATE TABLE concept\_relationships (

id UUID PRIMARY KEY,

source\_concept\_id UUID NOT NULL REFERENCES concepts(id),

target\_concept\_id UUID NOT NULL REFERENCES concepts(id),

relationship\_type VARCHAR(50) NOT NULL,

relationship\_strength FLOAT NOT NULL,

created\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

updated\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP

);

```

Defines relationships between concepts with type and strength indicators.

```sql

CREATE TABLE concept\_domains (

id UUID PRIMARY KEY,

name VARCHAR(255) NOT NULL,

description TEXT NOT NULL,

color\_code VARCHAR(7) NOT NULL,

created\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

updated\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP

);

```

Defines the major philosophical domains that organize concepts.

```sql

CREATE TABLE user\_constellations (

id UUID PRIMARY KEY,

user\_id UUID NOT NULL REFERENCES users(id),

created\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

updated\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP

);

```

Tracks user's personal constellation container.

```sql

CREATE TABLE user\_concept\_discoveries (

id UUID PRIMARY KEY,

user\_id UUID NOT NULL REFERENCES users(id),

concept\_id UUID NOT NULL REFERENCES concepts(id),

discovery\_date TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

mastery\_level INTEGER DEFAULT 1,

last\_interaction TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

UNIQUE(user\_id, concept\_id)

);

```

Records which concepts a user has discovered and their mastery level.

```sql

CREATE TABLE user\_concept\_connections (

id UUID PRIMARY KEY,

user\_id UUID NOT NULL REFERENCES users(id),

source\_discovery\_id UUID NOT NULL REFERENCES user\_concept\_discoveries(id),

target\_discovery\_id UUID NOT NULL REFERENCES user\_concept\_discoveries(id),

connection\_date TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

UNIQUE(user\_id, source\_discovery\_id, target\_discovery\_id)

);

```

Tracks connections users have made between concepts in their personal constellation.

```sql

CREATE TABLE wisdom\_paths (

id UUID PRIMARY KEY,

name VARCHAR(255) NOT NULL,

description TEXT NOT NULL,

creator\_id UUID REFERENCES users(id),

is\_system\_generated BOOLEAN DEFAULT FALSE,

total\_xp INTEGER NOT NULL DEFAULT 0,

estimated\_completion\_time INTEGER NOT NULL, -- in minutes

difficulty\_level INTEGER NOT NULL DEFAULT 1,

created\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

updated\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP

);

```

Stores system-generated and user-created wisdom paths.

```sql

CREATE TABLE wisdom\_path\_steps (

id UUID PRIMARY KEY,

path\_id UUID NOT NULL REFERENCES wisdom\_paths(id),

concept\_id UUID NOT NULL REFERENCES concepts(id),

step\_order INTEGER NOT NULL,

xp\_reward INTEGER NOT NULL DEFAULT 0,

created\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

UNIQUE(path\_id, step\_order)

);

```

Defines the sequence of concepts in a wisdom path.

```sql

CREATE TABLE curiosity\_triggers (

id UUID PRIMARY KEY,

question TEXT NOT NULL,

concept\_id UUID NOT NULL REFERENCES concepts(id),

domain\_id UUID REFERENCES concept\_domains(id),

difficulty\_level INTEGER NOT NULL DEFAULT 1,

created\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

updated\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP

);

```

Stores intriguing questions that serve as entry points to concepts.

```sql

CREATE TABLE organic\_nudges (

id UUID PRIMARY KEY,

nudge\_type VARCHAR(50) NOT NULL, -- 'thought\_fragment', 'revelation\_echo', 'question\_seed'

content TEXT,

concept\_id UUID NOT NULL REFERENCES concepts(id),

creator\_id UUID REFERENCES users(id),

is\_anonymous BOOLEAN DEFAULT TRUE,

created\_at TIMESTAMP WITH TIME ZONE DEFAULT CURRENT\_TIMESTAMP,

expires\_at TIMESTAMP WITH TIME ZONE

);

```

Stores user-generated content nudges for organic discovery.

## API Endpoints

### GET /api/v1/explore/concepts

Request:

```

{

"domain\_id": "550e8400-e29b-41d4-a716-446655440000", // Optional

"filter": "ethics", // Optional

"limit": 50, // Optional, defaults to 20

"offset": 0 // Optional, defaults to 0

}

```

Response:

```

{

"concepts": [

{

"id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"name": "Categorical Imperative",

"plain\_language\_description": "A simple description of Kant's moral principle",

"concept\_type": "ethics",

"color\_code": "#FF6B35",

"domain\_id": "550e8400-e29b-41d4-a716-446655440000",

"discovered": true, // if user has discovered this concept

"mastery\_level": 2 // if user has discovered this concept

},

// More concepts...

],

"total\_count": 120,

"next\_offset": 50

}

```

### GET /api/v1/explore/constellation

Request:

```

{

"user\_id": "7f4b3e1d-c8a2-4b9f-b3a1-2c8d7f4b3e1d" // Optional, defaults to current user

}

```

Response:

```

{

"constellation": {

"id": "9d8c7b6a-5f4e-3d2c-1b0a-9f8e7d6c5b4a",

"user\_id": "7f4b3e1d-c8a2-4b9f-b3a1-2c8d7f4b3e1d",

"discovered\_concepts": [

{

"id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"name": "Categorical Imperative",

"concept\_type": "ethics",

"color\_code": "#FF6B35",

"mastery\_level": 2,

"discovery\_date": "2025-05-15T14:30:00Z"

},

// More discovered concepts...

],

"connections": [

{

"source\_id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"target\_id": "b3e9f835-72d5-5e4f-0cb5-b8d02a9f943g",

"connection\_date": "2025-05-16T09:45:00Z"

},

// More connections...

],

"completion\_percentage": 12.5,

"domains\_explored": [

{

"id": "550e8400-e29b-41d4-a716-446655440000",

"name": "Ethics",

"completion\_percentage": 25.0

},

// More domains...

]

}

}

```

### GET /api/v1/explore/wisdom-paths

Request:

```

{

"path\_type": "system", // "system", "user", "community", or "all"

"limit": 10, // Optional, defaults to 5

"offset": 0 // Optional, defaults to 0

}

```

Response:

```

{

"wisdom\_paths": [

{

"id": "c6d5e4f3-2b1a-0c9d-8e7f-6d5e4f3c2b1a",

"name": "Ethics Foundation Path",

"description": "A journey through fundamental ethical theories",

"creator\_id": null, // null for system-generated paths

"is\_system\_generated": true,

"total\_xp": 250,

"estimated\_completion\_time": 45, // minutes

"difficulty\_level": 2,

"completion\_percentage": 30, // if user has started this path

"steps\_count": 8

},

// More paths...

],

"total\_count": 25,

"next\_offset": 10

}

```

### GET /api/v1/explore/wisdom-path/{path\_id}

Request:

```

{

"path\_id": "c6d5e4f3-2b1a-0c9d-8e7f-6d5e4f3c2b1a"

}

```

Response:

```

{

"path": {

"id": "c6d5e4f3-2b1a-0c9d-8e7f-6d5e4f3c2b1a",

"name": "Ethics Foundation Path",

"description": "A journey through fundamental ethical theories",

"creator\_id": null,

"is\_system\_generated": true,

"total\_xp": 250,

"estimated\_completion\_time": 45,

"difficulty\_level": 2,

"steps": [

{

"step\_order": 1,

"concept\_id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"concept\_name": "Categorical Imperative",

"xp\_reward": 30,

"completed": true // if user has completed this step

},

// More steps...

]

}

}

```

### POST /api/v1/explore/create-path

Request:

```

{

"name": "My Modern Ethics Journey",

"description": "A personal exploration of ethics in the digital age",

"steps": [

{

"concept\_id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"step\_order": 1

},

{

"concept\_id": "b3e9f835-72d5-5e4f-0cb5-b8d02a9f943g",

"step\_order": 2

},

// More steps...

],

"is\_public": true // Whether to share with community

}

```

Response:

```

{

"path\_id": "e8f7d6c5-b4a3-2b1c-0d9e-8f7d6c5b4a3",

"name": "My Modern Ethics Journey",

"total\_xp": 180, // Automatically calculated

"estimated\_completion\_time": 35, // Automatically calculated

"difficulty\_level": 2, // Automatically calculated

"created\_at": "2025-06-04T15:30:00Z"

}

```

### POST /api/v1/explore/discover-concept

Request:

```

{

"concept\_id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f"

}

```

Response:

```

{

"discovery": {

"concept\_id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"name": "Categorical Imperative",

"discovery\_date": "2025-06-04T15:35:00Z",

"mastery\_level": 1,

"xp\_earned": 3,

"related\_concepts": [

{

"id": "b3e9f835-72d5-5e4f-0cb5-b8d02a9f943g",

"name": "Deontological Ethics",

"relationship\_type": "parent",

"discovered": false

},

// More related concepts...

]

}

}

```

### POST /api/v1/explore/connect-concepts

Request:

```

{

"source\_concept\_id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"target\_concept\_id": "b3e9f835-72d5-5e4f-0cb5-b8d02a9f943g"

}

```

Response:

```

{

"connection": {

"source\_concept\_id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"target\_concept\_id": "b3e9f835-72d5-5e4f-0cb5-b8d02a9f943g",

"connection\_date": "2025-06-04T15:40:00Z",

"xp\_earned": 5

}

}

```

### POST /api/v1/explore/create-nudge

Request:

```

{

"nudge\_type": "thought\_fragment",

"content": "This concept completely changed how I view moral responsibility",

"concept\_id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"is\_anonymous": true

}

```

Response:

```

{

"nudge\_id": "f9e8d7c6-b5a4-3b2c-1d0e-9f8e7d6c5b4a",

"created\_at": "2025-06-04T15:45:00Z",

"xp\_earned": 2

}

```

### GET /api/v1/explore/nudges

Request:

```

{

"concept\_id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"nudge\_type": "all", // "thought\_fragment", "revelation\_echo", "question\_seed", or "all"

"limit": 10

}

```

Response:

```

{

"nudges": [

{

"id": "f9e8d7c6-b5a4-3b2c-1d0e-9f8e7d6c5b4a",

"nudge\_type": "thought\_fragment",

"content": "This concept completely changed how I view moral responsibility",

"concept\_id": "a2f8d724-61c4-4d3f-9ba4-a7c91838230f",

"created\_at": "2025-06-04T15:45:00Z"

},

// More nudges...

]

}

```

## User Experience Flow

### Stage 1: Initial Exploration (5-10 minutes)

User lands on ExploreScreen seeing cosmic visualization with major philosophical domains as "suns" and curiosity triggers as "shooting stars." User taps a curiosity trigger ("Why do good people do bad things?") which zooms into the Ethics domain, revealing relevant concepts with plain language tooltips. User taps a concept, opening ConceptDetail with simplified explanation. System awards curiosity completion XP (+15) and lights up constellation node.

### Stage 2: Constellation Building (10-20 minutes)

User returns to ExploreScreen to see their updated constellation with newly lit concept. User freely navigates the cosmic space using pan/zoom, drawn to unexplored areas. Each concept discovery adds to their personal constellation and awards exploration XP (+3). User discovers related concepts and creates connections between them, forming a unique philosophical map with color-coded concept types. System tracks constellation completion percentage and domains explored.

### Stage 3: Wisdom Path Navigation (15-30 minutes)

User toggles to "System Guided" mode, revealing recommended wisdom paths based on their exploration history. User selects a path (e.g., "Ethics Foundation Path") which displays an animated trail overlay showing the sequence of concepts to explore. User follows the path, earning XP for each completed step and strengthening the trail color. User can switch to "Free Explore" mode at any time, with the system saving their path progress.

### Stage 4: Community Engagement (10-15 minutes)

User discovers organic nudges (thought fragments, revelation echoes, question seeds) around concepts, providing insights from other users. User saves interesting nudges to their Journal and contributes their own anonymous thoughts. User creates a personal wisdom path based on their exploration and shares it with the community. System suggests related quests based on the user's exploration patterns.

### Stage 5: Cross-Feature Integration (Ongoing)

User seamlessly moves between Explore and other app features: asking the AI about discovered concepts, journaling reflections, participating in forum discussions about concept relationships, and completing quests related to their exploration. Each interaction enriches their personal constellation and contributes to the community knowledge ecosystem.

## Gamification & XP Integration

| Action | XP Reward | Conditions |

|--------|-----------|------------|

| Curiosity Completion | +15 XP | Following curiosity trigger to concept detail |

| Concept Discovery | +3 XP | First-time viewing of a concept |

| Concept Connection | +5 XP | Creating a connection between two concepts |

| Path Step Completion | +10-30 XP | Varies based on concept complexity |

| Path Completion | +50 XP | Completing all steps in a wisdom path |

| Creating Wisdom Path | +25 XP | Creating and sharing a wisdom path |

| Contributing Nudge | +2 XP | Creating thought fragment or question seed |

| Discovery Streak | +5 XP per day | Exploring at least 3 concepts daily |

### Mastery System

- Concept Mastery Levels (1-5) tracked across all features

- Domain Mastery calculated from concept mastery within domain

- Visual indicators show mastery progress in constellation view

- Mastery level affects XP rewards for related activities

## Advanced Workflows

### Explore-to-Quest Integration

1. System analyzes user's exploration patterns and concept mastery

2. Identifies knowledge gaps or areas of high interest

3. Offers contextually relevant quests at logical points in exploration

4. Example: After exploring 3+ ethics concepts, suggests "Ethical Dilemmas" quest

5. Quest completion updates concept mastery in exploration view

### Organic Discovery System

1. Anonymous Thought Fragments

- Brief insights from other users appear as particles around concepts

- Hover reveals the thought without identifying the creator

- Users can contribute their own thoughts after reaching concept mastery level 2+

2. Personal Revelation Echoes

- Visual indicators of breakthrough moments experienced by others

- Intensity varies based on how many users had revelations at that concept

- Creates anticipation for personal discovery

3. Community Question Seeds

- Intriguing questions planted by other users in unexplored areas

- Questions bloom when approached, potentially leading to new concept discoveries

- Users can plant their own questions after reaching concept mastery level 3+

### Cross-Feature Content Flow

1. Exploration → AI Questions

- Contextual prompts suggest AI exploration of concepts

- "Ask the AI Philosopher about this concept" option in ConceptDetail

2. Exploration → Journal

- "Reflect in Journal" option for discovered concepts

- Journal entries automatically tagged with relevant concepts

3. Exploration → Forum

- Concept-specific discussion threads accessible from ExploreScreen

- "Join the conversation" option for concepts with active discussions

## Implementation Considerations

### Visualization Performance

- Use WebGL for rendering complex cosmic visualization

- Implement level-of-detail rendering based on zoom level

- Cache constellation data locally for smooth navigation

- Progressive loading of concept details and relationships

### Offline Support

- Store user's recent exploration history locally

- Enable basic constellation viewing without network connection

- Queue user actions (discoveries, connections) for sync when online

- Provide clear visual indicators for offline mode

### Accessibility Features

- Text alternatives for visual constellation elements

- Keyboard navigation options for cosmic visualization

- Screen reader support for concept descriptions and relationships

- High contrast mode for better visibility

- Alternative list view for concepts as backup to visualization

### Celery Task Integration

- Background processing for wisdom path generation

- Asynchronous updates to user mastery levels across features

- Periodic calculation of concept popularity and relationship strength

- Scheduled cleanup of expired organic nudges

### Caching Strategy

- Cache user constellation data in Redis (TTL: 1 hour)

- Cache popular concepts and domains (TTL: 24 hours)

- Cache wisdom paths (TTL: 12 hours)

- Local storage caching of recently viewed concepts

## Implementation Phases

### Phase 1: Core Visualization (Weeks 1-3)

- Implement basic cosmic visualization with domains and concepts

- Create concept detail view with progressive revelation

- Set up database models and core API endpoints

- Implement basic user constellation tracking

### Phase 2: Navigation & Paths (Weeks 4-6)

- Add curiosity triggers and guided exploration

- Implement wisdom path system (system-generated)

- Create path navigation interface

- Enhance constellation building with connections

### Phase 3: Community Features (Weeks 7-9)

- Implement organic nudge systems

- Add user-created wisdom paths

- Create community path sharing

- Integrate with Journal and Forum features

### Phase 4: Advanced Integration (Weeks 10-12)

- Implement Quest integration

- Enhance AI integration

- Add advanced analytics and recommendations

- Optimize performance and accessibility