Survey Creation & Scoring Tool: Revised PRD

Executive Summary

The Survey Creation & Scoring Tool will provide a streamlined way for admins to create, deploy, and analyze validated health assessments within the Reputable platform. Based on our analysis of complex survey instruments (PSQI, DASS-21, FSFI), we've redesigned the approach to focus on pre-configured templates for validated surveys, significantly reducing setup complexity while maintaining scientific rigor. This revised PRD outlines the implementation of this template-based approach while providing flexibility for custom surveys when needed.

Product Vision

Enable researchers and wellness brands to easily incorporate scientifically validated survey instruments into their studies, with automatic scoring, analysis, and visualization alongside wearable data.

Key User Needs

1. **Streamlined setup** of complex, validated survey instruments
2. **Accurate, automatic calculation** of standardized scores and composite metrics
3. **Integrated analysis** showing survey results alongside wearable data
4. **Regulatory compliance** with proper use of validated instruments

Core Feature Set

1. Validated Survey Template Library

A curated collection of pre-configured, scientifically validated survey instruments that researchers commonly use in wellness studies.

UI Components & Flow

Copy

```
[Study Setup] > [Surveys] > [Add Survey]

Survey Types:
```

```
[✓] Use Validated Template   [ ] Create Custom Survey

Select Template:
[ Pittsburgh Sleep Quality Index (PSQI) ▼ ]

Description: The PSQI is a self-rated questionnaire that assesses
sleep quality and disturbances over a 1-month time interval. It
differentiates "poor" from "good" sleep by measuring seven
components: subjective sleep quality, sleep latency, sleep duration,
habitual sleep efficiency, sleep disturbances, use of sleeping
medication, and daytime dysfunction.

Survey Schedule:
[✓] Baseline (Pre-study)
[✓] End of study
[ ] Custom: Every ___ days

[Preview Survey]   [Add to Study]
```

Technical Implementation

- Each template stored as a complete survey object including:
  - Questions and response options
  - Scoring algorithm (JavaScript function)
  - Domain components and composite metrics
  - Interpretation guidelines and clinical thresholds
- Initial template library to include:
  - Pittsburgh Sleep Quality Index (PSQI)
  - Depression Anxiety Stress Scale (DASS-21)
  - Additional templates based on client needs

2. Simple Survey Builder (for Custom Surveys)

For cases where researchers need to create their own surveys rather than using validated templates.

UI Components & Flow

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```
[Study Setup] > [Surveys] > [Add Survey]

Survey Types:
[ ] Use Validated Template   [✓] Create Custom Survey

Basic Information:
```

```
Survey Name: [                     ]
Description: [                     ]

Questions:
[+ Add Question]

For each question:
- Question Text: [                     ]
- Question Type: [Multiple Choice ▼]
- Response Options: [Add options based on type]
- Scoring: [Define simple score mapping]

Composite Metrics (Optional):
[+ Add Composite Metric]
- Metric Name: [                     ]
- Contributing Questions: [Select questions]
- Calculation Method: [Sum ▼]

Survey Schedule:
[ ] Baseline (Pre-study)
[ ] End of study
[ ] Custom: Every ___ days

[Preview Survey]   [Add to Study]
```

Technical Implementation

- Dynamic form builder with simple score mapping
- Support for basic calculation methods (sum, average, weighted average)
- Simplified formula builder for custom calculations

3. Survey Response Collection

Distributes surveys to participants at scheduled intervals and stores their responses.

Technical Implementation

- Integration with existing mobile app for participant survey delivery
- Automatic notification system for due surveys
- Response storage with timestamps and completion status

4. Scoring Engine

Automatically processes survey responses using the appropriate scoring algorithm for each survey type.

Technical Implementation

- Encapsulated scoring functions for each validated survey template

For PSQI:
javascript
Copy

```
function calculatePSQIScores(responses) {
  // Component 1: Subjective sleep quality
  const component1 = responses.Q9;

  // Component 2: Sleep latency
  let latencyQ2Score = 0;
  if (responses.Q2 <= 15) latencyQ2Score = 0;
  else if (responses.Q2 <= 30) latencyQ2Score = 1;
  else if (responses.Q2 <= 60) latencyQ2Score = 2;
  else latencyQ2Score = 3;

  let latencyQ5aScore = responses.Q5a;
  let component2 = 0;
  const latencySum = latencyQ2Score + latencyQ5aScore;
  if (latencySum === 0) component2 = 0;
  else if (latencySum <= 2) component2 = 1;
  else if (latencySum <= 4) component2 = 2;
  else component2 = 3;

  // Similar calculations for other components...

  // Calculate global score
  const globalScore = component1 + component2 + component3 +
component4 + component5 + component6 + component7;

  return {
    componentScores: {
      sleepQuality: component1,
      sleepLatency: component2,
      sleepDuration: component3,
      sleepEfficiency: component4,
      sleepDisturbances: component5,
      sleepMedication: component6,
      daytimeDysfunction: component7
    },
    globalScore: globalScore
  };
```

- `}`
- Generic interpreter for custom survey formulas

5. Results Dashboard

Displays survey results alongside wearable data in the admin dashboard, with appropriate visualizations and statistical analysis.

UI Components & Flow

Copy

```
[Study Results] > [Surveys]

Overview:
- Response Rate: 95%
- Completion Rate: 92%
- Most Recent Data: Oct 3, 2024

Survey Results:
METRIC               RAW CHANGE    % CHANGE       % WHO IMPROVED
STATISTICAL SIGNIFICANCE
PSQI Global Score    -3.2          27% better     62%
Reliable Significance
Sleep Quality        -0.8          30% better     60%
Reliable Significance
Sleep Latency        -12 min       25% better     55%
Reliable Significance

[Click on metric to view details]

When clicking a metric:
- Line graph showing change over time
- Pre/post comparison with statistical analysis
- Distribution of scores across participants
- Correlation with wearable data (when applicable)
```

Technical Implementation

- Interactive data visualization components
- Statistical analysis package for calculating significance, effect sizes, etc.
- Cross-correlation engine to identify relationships between survey and wearable data

Technical Architecture

Data Models

Survey Template

javascript

Copy

```
{
  id: String,
  name: String,
  type: "validated" | "custom",
  description: String,
  questions: Array,
  scoringAlgorithm: Function,
  domains: Array,
  interpretationGuidelines: Object
```

1. `}`

Survey Response

javascript

Copy

```
{
  id: String,
  surveyId: String,
  participantId: String,
  timestamp: Date,
  timepoint: "baseline" | "end" | Number,
  responses: Object,
  calculatedScores: Object,
  status: "complete" | "partial" | "missed"
```

2. `}`

Study Survey Configuration

javascript

Copy

```
{
  id: String,
  studyId: String,
  surveyTemplateId: String,
  schedule: {
    baseline: Boolean,
    end: Boolean,
    custom: Array
  },
  deploymentStatus: "active" | "draft" | "completed"
```

3. `}`

API Endpoints

1. **Survey Template Management**
   - `GET /survey-templates` - List available templates
   - `GET /survey-templates/:id` - Get specific template details
   - `POST /survey-templates` - Create custom template
2. **Study Survey Configuration**
   - `POST /studies/:id/surveys` - Add survey to study
   - `GET /studies/:id/surveys` - List study surveys
   - `PUT /studies/:id/surveys/:surveyId` - Update survey configuration
3. **Survey Responses**
   - `POST /participants/:id/surveys/:surveyId/responses` - Submit response
   - `GET /studies/:id/survey-results` - Get aggregated results
4. **Results Analysis**
   - `GET /studies/:id/surveys/:surveyId/analysis` - Get statistical analysis
   - `GET /studies/:id/surveys/:surveyId/correlations` - Get correlations with other data

Implementation Priorities for Replit Prototype

For the initial prototype with Replit, we recommend focusing on:

1. **Phase 1: Template Library with PSQI**
   - Implement the template selection interface
   - Build the PSQI template with complete scoring algorithm
   - Create the survey scheduling UI
   - Demonstrate integration with existing dashboard
2. **Phase 2 (if time permits): Results Visualization**
   - Implement basic results overview
   - Show pre/post comparison of PSQI scores
   - Demonstrate integration with wearable data

User Experience Flow

1. **Admin adds PSQI survey to study**
   - Admin navigates to Study Setup > Surveys
   - Selects "Add Survey" > "Use Validated Template"
   - Chooses "Pittsburgh Sleep Quality Index (PSQI)"
   - Configures survey schedule (baseline and end-of-study)
   - Previews survey to confirm content
   - Adds to study
2. **Participant completes survey in mobile app**
   - Participant receives notification that survey is available
   - Opens app and completes survey
   - Submits responses
3. **Admin views results**
   - Admin navigates to Study Results > Surveys
   - Views overview of PSQI results, including component scores and global score
   - Clicks on specific metrics to see detailed analysis
   - Views correlations between PSQI scores and wearable sleep data

Technical Considerations for Replit

1. **Modular Architecture**
   - Implement scoring algorithms as separate modules
   - Use React components that can be easily integrated into existing dashboard
2. **Data Simulation**
   - Include mock participant responses for demonstration
   - Simulate baseline and end-of-study data to show changes
3. **Integration Points**
   - Define clear interfaces for connecting with existing dashboard
   - Ensure styling matches current UI patterns

Success Metrics

The successful implementation will:

1. Allow admins to add PSQI to a study without manual configuration
2. Correctly calculate all seven PSQI components and global score
3. Display results in an intuitive, visually appealing format
4. Integrate with existing dashboard design patterns
5. Demonstrate the template approach can be extended to other validated surveys