

## Segment 1: Pain Relievers and Gain Creators

**Key pains** related to process and results in problem solving, summarized from 4Q analysis:

- Not clear how to resolve trade-offs between requirements, preferences and constraints in the design of the digital therapy tool
- Conventional approach likely to yield boring design that does not have a clear added value compared to existing solutions.
- Design and development process typically expensive and time consuming

→ **Pain relievers** from involving crowds?

- Involving diverse crowd may generate creative solutions that differ from what has been done before
- Some crowd members find novel technical and design approaches to reconcile conflicting goals and constraints
- Parallel search by many crowd members could speed up the process and decrease the costs

**Key gains** related to process and results in problem solving, summarized from 4Q analysis:

- Potential "bonus" for co-created solutions in the eyes of future users, insurance companies, etc.

→ **Gain creators** from involving crowds?

- By co-creating the tool with crowds, we may increase evaluations (by patients, insurance companies, doctors, etc.) and adoption
- Involving self-help group organizers in evaluation of outcomes may result in additional feedback for further development and clinical trials; perhaps help distribute/diffuse the therapy tool once finished and approved

**Feasibility check:** Can the design really address the pains/gains you identified?  
**Opportunity check:** Can crowd involvement address pains/gains not considered before?

## Segment 2: Strategic Design Choices

**Crowd Science Paradigm Diamond**  
(Why involve a crowd?)

- Crowd volume: **Somewhat relevant**
- Broadcast search: **Very relevant**
- User crowd: **Less relevant** (problem solvers); **very relevant** (SUD support group organizers to evaluate solutions)
- Community production: **Somewhat relevant**
- Crowd wisdom: **Less relevant**; **somewhat relevant** (if let support group organizers vote on designs)

**AKRD Crowd Contribution Matrix**  
(What does the crowd contribute?)

Activities	Read problem description; come up with structural designs for digital therapy solution (individually or in teams); evaluate solutions (SUD support group organizers)
Knowledge	Knowledge on designing digital tools; some knowledge of technical aspects (for feasibility); experiential knowledge (support group organizers)
Resources	Computer, internet; development tools
Decisions	Generate decision options (different aspects of the high-level and user interface design, approaches to reconcile conflicting requirements, etc.); evaluate and select solutions (support group organizers)

**Six Crowd Characteristics**  
(Who is the crowd?)

- Location: Global (English speaking)
- Knowledge and skills: Knowledge on designing digital tools; some knowledge of technical aspects; experiential knowledge (SUD support group organizers)
- Time commitment: **High** (several days); **medium** (a few hours, support group organizers)
- Resources: Computer, internet; development tools
- Size: Medium (30–50 who submit a solution); 50–100 support group organizers
- Diversity: Field backgrounds, different technical approaches; diverse SUD-related experiences (support group organizers)

**Feasibility check:** Is the design realistic? What adjustments need to be made?

## Segment 3: Implementation Challenges and Solutions

**Key challenges and solutions specific to this particular stage of the project:**

- Lack of domain-specific knowledge: Write detailed problem description (no jargon, keep general, provide all necessary information)
- Defining quality and providing feedback: Technical feasibility – judged by digital health tool experts or university software developers (allow intermediate feedback); our team is available for clarifying questions; User friendliness: Judged by SUD support group organizers (only after final submission)

**Organizational challenges and solutions that cut across all stages** (see chapters 13–14):

- Dividing and allocating tasks: Problem solving is the main task; additional task division up to problem solvers (or teams)
- Coordinating crowd members: No coordination among individual solvers; if people work in teams, then coordinate on their own (using platform infrastructure)
- Training and enabling learning: Less relevant (but I will supply detailed problem description)
- Increasing quality and evaluating contributions: Intermittent technical feedback; on-demand clarifications provided by us
- Motivating crowd members: Prizes for best solution; importance of the cause
- Recruiting crowd members: Recruit problem solvers through the platform pool, distribute call on social media and through advocacy organizations and universities; go back to support group organizers from first project to help with evaluation of crowdsourced solutions

**Research integrity and ethical issues that cut across all stages** (see chapter 15):

- Ensuring quality and preventing misconduct: Clear problem description, specification of quality criteria; rely on platform tools to facilitate process
- Recognizing effort and sharing project outputs: Rely on platform standards (e.g., allocation of intellectual property rights), potential future collaboration options
- Role of AI: Encourage problem solvers to use genAI for idea generation and intermediate feedback
- Privacy, safety, institutional oversight: Not relevant