

# 1 Core Functional Modules of ProDAIS

## 1.1 Speech-to-Text (STT)

Speech-to-Text (STT) provides a shared transcript that externalises spoken contributions and supports collective understanding during discussion (Figure 1). Spoken input is transcribed in real time and displayed to all participants as a shared artefact.

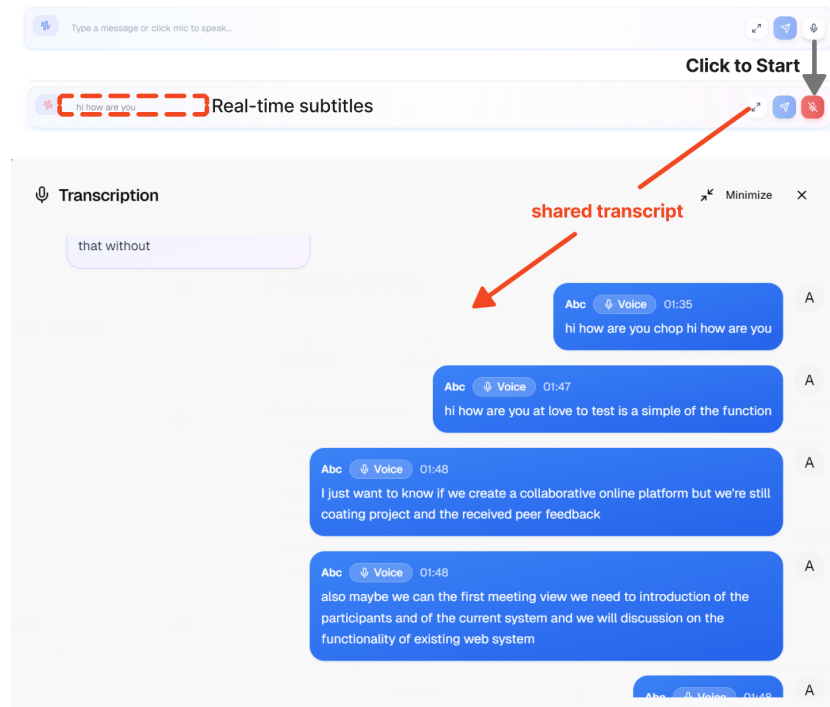


Fig. 1: Speech-to-Text (STT) module showing real-time shared transcription during discussion.

## 1.2 Summarisation

Summarisation offers brief periodic and final summaries to help groups review progress and maintain a shared focus over time (Figure 2). Summaries synthesise recent discussion content into structured highlights.

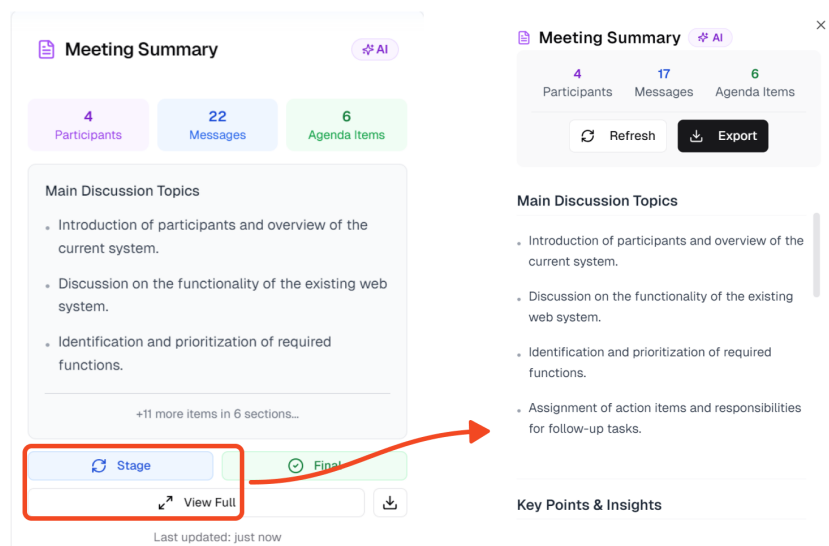


Fig. 2: Summarisation module providing stage-based and final summaries of discussion progress.

### 1.3 Support Quiet

Support Quiet encourages more balanced participation by gently inviting quieter members to contribute when prolonged silence is observed (Figure 3). Invitations are phrased as non-evaluative prompts to minimise social pressure.

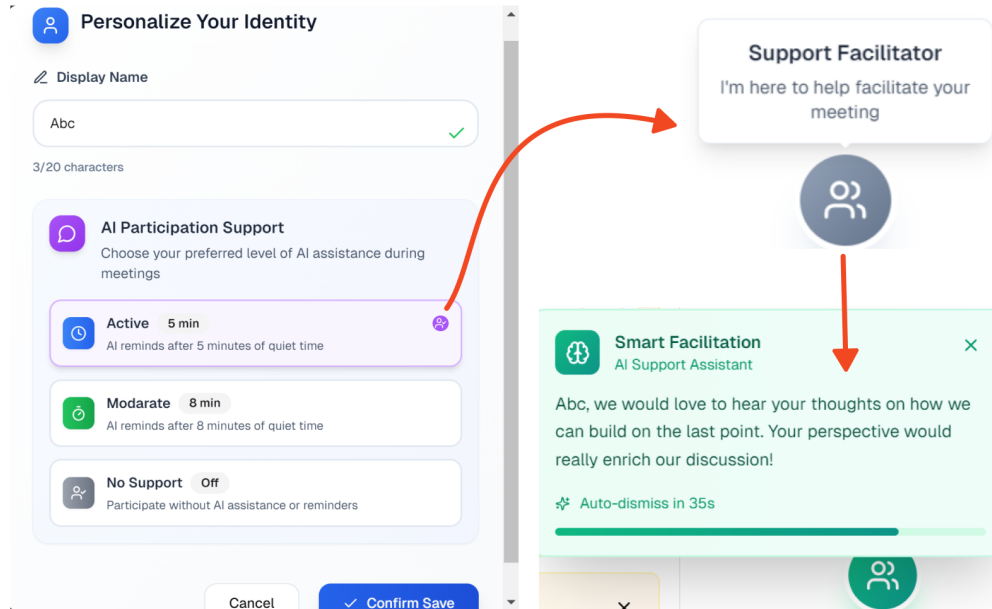


Fig. 3: Support Quiet module illustrating an AI-generated invitation triggered by prolonged silence.

### 1.4 Agenda

Agenda helps regulate discussion pacing by visualising time and signalling transitions between discussion phases (Figure 4). Visual cues support shared awareness of progress without interrupting interaction.

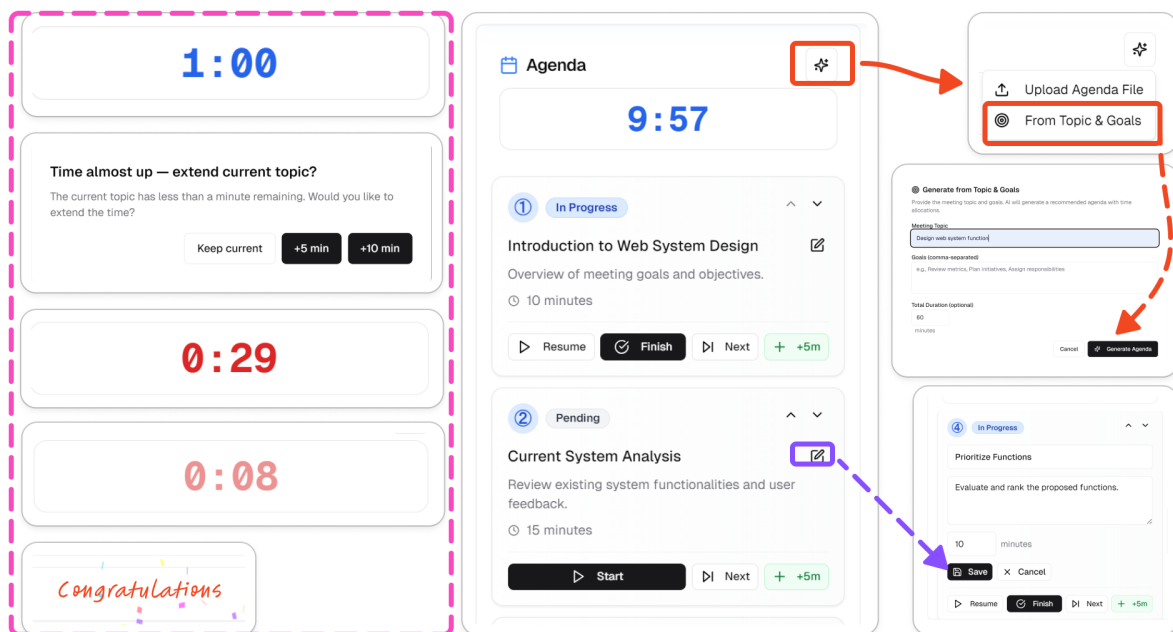


Fig. 4: Agenda module visualising time allocation and phase transitions during discussion.

## 1.5 Brainstorming

Brainstorming supports idea generation by providing short prompts when discussion slows or when participants explicitly request inspiration (Figure 5). Prompts are designed to be lightweight and non-directive.

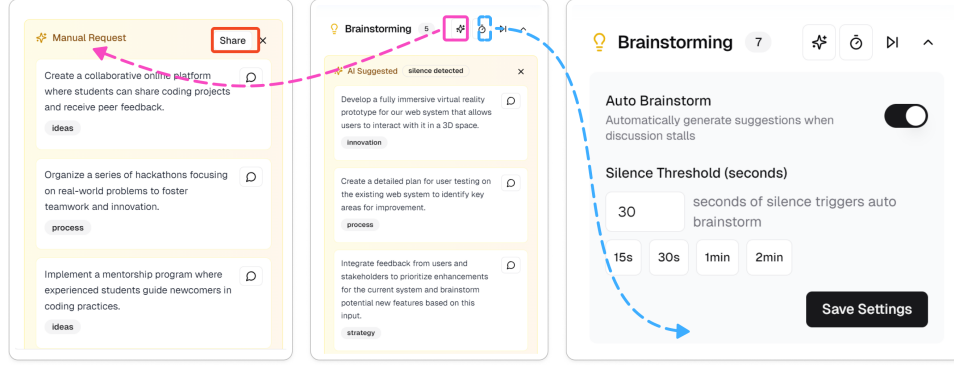


Fig. 5: Brainstorming module offering brief AI-generated prompts to stimulate idea generation.

Together, these modules allow ProDAIS to support group discussion through shared visibility, timing cues, and gentle invitations, while minimising disruption to ongoing interaction.

## 2 System Workflow

ProDAIS follows a simple cyclical workflow consisting of interaction capture, state monitoring, targeted support, and post-meeting reflection (Figure 6).

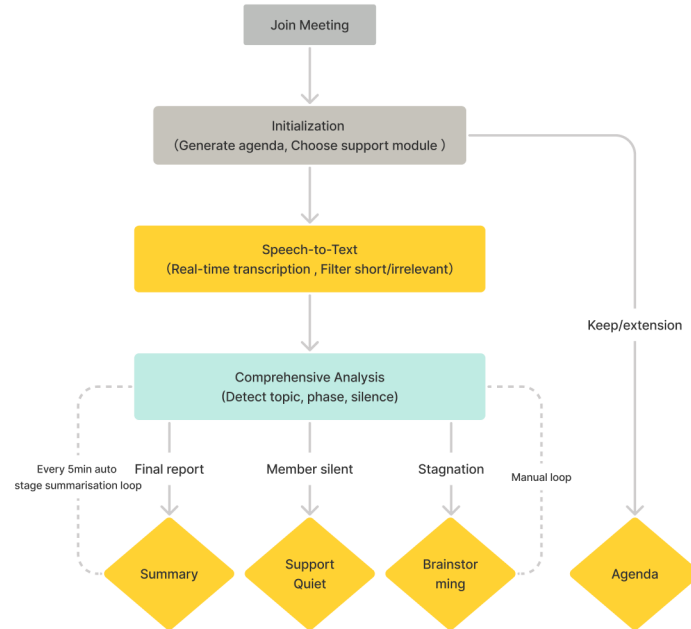


Fig. 6: System workflow of ProDAIS, illustrating the cycle of sensing, regulation, and reflection.

During a meeting, speech is transcribed and shared with participants, while discussion timing and participation patterns are continuously monitored. When notable conditions such as prolonged silence, phase transitions, or reduced momentum occur, ProDAIS activates the relevant module. After the meeting concludes, a final summary is generated to support reflection and follow-up activities.

### 3 Detailed Implementation Parameters and Trigger Logic

Table 1 summarises the trigger logic and key parameters governing each ProDAIS module. These parameters were designed to balance responsiveness with minimal intrusion.

Table 1: Trigger logic and safeguard parameters of ProDAIS modules

Core Function	Trigger Logic	Key Parameters and Safeguards
<b>Speech-to-Text (STT)</b>	Activated automatically when a participant speaks for more than 1.5 seconds. Text segments are processed in batches every 2–3 seconds to ensure continuous transcription.	Filters fillers; ignores utterances shorter than 10 words; merges pauses shorter than 2 seconds; automatically clears transcripts after 60 minutes to protect privacy.
<b>Summarisation</b>	Triggered every 5 minutes or upon manual “Generate Summary” request. The LLM processes recent transcripts to produce a concise Markdown summary.	Maximum length 250 words; 90-second cooldown between summaries; retains last five summaries; suppresses generation if fewer than 10 new utterances are detected.
<b>Support Quiet</b>	Activated when a participant remains silent beyond a defined threshold (5 minutes in Active mode; 8 minutes in Moderate mode) or when an @mention receives no reply for 2 minutes.	Global cooldown 45 seconds; per-user cooldown 60 seconds; rotating prompt templates; adjustable sensitivity; avoids inviting the same member consecutively.
<b>Agenda Timer</b>	Initiated when the host launches a topic timer. Visual alerts appear 30 seconds before time expires and intensify during the final 10 seconds.	Default duration 3–20 minutes; extendable in 5-minute increments; supports pause, resume, and skip; visual-only notifications to minimise disruption.
<b>Brainstorming</b>	Triggered automatically after 3–5 minutes of silence or via manual “Brainstorm” request. The LLM generates 3–5 categorised idea prompts.	Minimum cooldown 5 minutes; each suggestion limited to 30 words; disables auto-trigger for 10 minutes after manual use; logs prompt categories for reflection.