Experience Report: E-Ballot System for Toastmasters Speech Contests

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2026-04-16

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1 Executive Summary

This report details my development, iterative testing, and successful deployment of an electronic ballot (e-ballot) system for Toastmasters speech contest judging, built to solve the critical logistical ceiling in contest administration: the inherent inaccuracy and delays of manual paper processing. Over seven events — test sessions in club meetings, club-level contests, and joint area contests running 12 back-to-back contests in a single day — I refined the system, which served as the sole system of record at one such joint event and demonstrably outperforms the traditional paper system in speed, auditability, and resilience. The system's advantage grows with event load.

The evidence gathered and the corresponding system enhancements across all phases strongly support adopting the e-ballot system as the authoritative system of record, replacing paper ballots. The primary gains are speed, consistency, and freedom from human counting fatigue. The main conditions for reliable deployment are a structured judge briefing with dedicated practice time and identity verification instruction before each contest.

2 Background and Motivation

2.1 The Current Paper-Based System

In my experience as both a contestant and an organizer, I have seen the traditional paper-based system struggle to keep pace with the growing popularity of Toastmasters and its contests. As a contestant in previous years, I watched our events become dreadfully long, often due to the manual overhead of computing results.

In Toastmasters speech contests, judges evaluate each contestant according to a fixed set of criteria and submit their individual final rankings on paper ballots. While a simple and familiar process, it introduces significant operational risks during high-volume events. In a standard contest, ballot counters approach each judge to collect their ballot, an act which breaks the judge's anonymity. Once all ballots are collected, the chief judge and ballot counters move to a separate private counting room to tally the records. Only after completing tabulation and verification, the counting team may return with the filled forms back to the event room to adjourn the contest.

This year, as Area Director, I faced the daunting responsibility of organizing 12 contests with a maximum participation of 66 contestants, which is only known with certainty about a week before the event. With a strict 10-hour venue limit, I identified that the traditional paper workflow was no longer viable. The standard process creates a systemic bottleneck:

Collection Delays The physical collection of ballots is time-consuming and often requires several minutes of idle time while officials move through the room. Sometimes contests stall for minutes while officials track down a single missing piece of paper or wait for a collector to navigate the room.

Human Counting Fatigue Manual tallying is inherently error-prone. At larger events, I have seen counting teams struggle with fatigue as they work through multiple sequential contests, which directly impacts the time to reach reliable results.

The "Dead Time" Gap Results are held back until every piece of paper is physically accounted for and transcribed, creating significant delays and breaking the momentum of the event for the audience.

Logistical Burden I found the requirement to print and manage around hundred ballots for 12 back-to-back contests to be a significant logistical annoyance and a waste of resources.

2.2 The Case for Digitization

I designed a digital system to ensure our Area contest remained within its 10-hour window while maintaining fairness, consistency and deterministic accuracy. The E-Ballot system solves these specific pressures:

Collection delay Judges submit from their own mobile device; no physical handling required. Chief judge monitors submission status in real time and announces when all ballots are in, without waiting for paper to pass through hands.

Human counting Fatigue Tallying is instantaneous and deterministic — the system does not get tired or make arithmetic errors. At large events with many back-

to-back contests, the compounding cognitive load on human counters disappears entirely. The system remains unaffected by the number of contests, ensuring the final result of the day is as reliable as the first.

Professional experience By removing the "dead time" between contests, I ensure the event remains engaging for the audience and respectful of contestants' and volunteers' time.

2.3 Scope of This Report

This report covers the design rationale of the e-ballot system, the iterative development and testing history across seven events, including the full digital deployment at an area contest, and a parallel validation run at a second area. I will explain the design principles I chose, the specific failures I encountered and corrected over seven iterations, and the data I gathered that demonstrates the digital system's superiority over paper. I conclude with a formal recommendation for adopting this system as the authoritative record for future contests.

3 System Description

The e-ballot system is a mobile-first web application designed to digitize the collection and tallying of speech contest results without altering the fundamental judging process. By providing real-time oversight to the chief judge, dedicated tools for the timer, and ballots for the judges, the system reduces the cognitive load and "dead time" inherent in paper-based administration. The event organizer carries a new responsibility: setting up the event in the digital system before the day.

3.1 Design Principles

- **Accessibility**: judges use their own device and browser; no setup required on their part
- **Simplicity**: the interface exposes only what the judge needs for their task
- **Integrity**: each submission carries a timestamp and judge identity
- **Speed**: results are ready the moment the last ballot arrives

3.2 Key Features

- Mobile-first interface designed for use on personal smartphones
- No app installation required — runs in any standard mobile web browser
- Contest-specific criteria and contestant list configured before each event
- Individual judge workflow: score → rank → review → submit
- Confirmation step before final submission to prevent accidental ballots
- Chief judge dashboard showing real-time submission status
- Timer receives a stopwatch within the application and submits their report directly

- Judges and contestants can file a protest; the chief judge resolves them
- Instantaneous tallying once all submissions arrive.

3.3 Key Roles

The system is designed to provide high-stakes contest officials with deterministic results while maintaining the necessary distance from judges. Screenshots of the following roles are available in A: Application Visuals.

3.3.1 Chief Judge

The digital system provides the Chief Judge with a live *Submission Status* view (Fig. 6). This dashboard acts as a silent heartbeat for the contest; it does not place the Chief Judge in the spotlight, but rather allows them to monitor the collection process from their own device.

They can see in real-time exactly which ballots are missing. The moment the final digital ballot arrives, they can adjourn the contest immediately, eliminating the "dead time" of physical collection and manual counting.

The dashboard also includes a view for handling protests and disqualification events (Fig. 7). With flexible manual controls, the chief judge can undo automatic timer disqualifications, resolve protests directly, and have them propagate automatically into the final result.

3.3.2 Voting Judges and Tiebreaker

Voting judges receive three alternative views for judging within a contest, all of which display the full participant names. An overview lists all contestants with their running totals at a glance (Fig. 1).

Individual Contestant Slider controls let the judge score each contestant across the judging criteria specified in Toastmasters International judging ballots. The application totals all scores and ranks contestants before ballot submission (Fig. 2).

Tabular View Reproduces the Toastmasters International judging ballot. Judges compare contestants across criteria on a single screen and enter scores numerically. The application totals and ranks contestants before submission (Fig. 3).

Manual Ranking Judges pick the contestants' final ranking directly for ballot submission. Used mainly by judges who scored on paper and transfer their final ordering to the digital ballot (Fig. 4).

3.3.3 Timer

Like judges, the Timer receives for each contest the listing of all contestants. For each contestant, the system presents a dedicated stopwatch module with color-coded signals — Green, Yellow, Red — mirroring the physical lights shown to the speaker. After the clock stops, a one-minute countdown assists the timer in tracking the scoring interval allotted to judges (Fig. 8). The timer can manually correct the time record before submitting;

once submitted, the report is final. Any timing disqualifications propagate instantly to the final result.

3.3.4 Event Organizer

I currently set up every event by directly editing the contest database: registering participants, creating contests, assigning roles per contest, generating the schedule, and sending personal authentication links. This works, but it means the system cannot run without me — no other organizer can configure a contest independently.

Building a self-service organizer interface is the next development priority, and testing it under real conditions is a primary goal of the proposed pilot extension to Division and District level. Until that interface exists and is validated, the system depends on the developer's direct involvement at every event. See Path Forward (§ 7).

3.4 Rules Compliance

The e-ballot system maintains full compliance with Toastmasters International contest rules while improving the operational experience for all officials.

Official ballot content The system reproduces the official WH judging criteria verbatim — identical criterion names, groupings, and point ranges — for all covered speech types: International Speech, Evaluation, and Table Topics. The tabular judging view introduced in Iteration 7 is a direct digital replication of the WH paper ballot layout, with the recommended scoring ranges displayed alongside each criterion. Adding further contest types is a configuration step. The slider interface and the contestant-names-at-a-glance feature add ergonomic value on top of, not instead of, the official content.

Electronic signature (Rule 5.I.1.b) Each judge's ballot submission constitutes their electronic signature. Every judge receives a unique personal authentication link by email before the event. Opening that link establishes a verified session over a TLS-encrypted connection, maintained by industry standard controls, cryptographically tying every submitted ballot to a verified judge identity. The system classifies every submission as either a registered judge's ballot or an anonymous audience vote — the system fails safe, and no unauthenticated ballot has ever entered the contest results.

Ballot and results integrity The database enforces one ballot per judge per contest. A judge may register more than one device for convenience, but only one submission ever counts. No duplicate has ever entered the contest results.

Ballot confidentiality The judge's criterion-level scores stay on their device; the submitted ballot carries exclusively the final contestant ranking, consistent with contest rules (5.I.2) that treat scoring as the judge's private record. The chief judge monitors submission status in real time, and the chief judge obtains the final tally only once all ballots arrive. The event administrator can view individual judge rankings for audit purposes. No other views of the results exist.

Result calculation and tiebreaking A single deterministic query encodes the official rules and computes contest results, including tiebreaking and disqualifications from timing infractions or upheld protests. The process requires no manual interpretation

and no on-site rulebook consultation. The same logic applies consistently from the first contest of the morning to the last of the evening, without degradation.

Ballot destruction (Rule 5.I.2.a & 5.L) The rule exists to prevent judges from discarding scored paper ballots at the venue, where someone could retrieve and use them to identify how individuals voted. This threat does not apply to digital ballots on a judge's personal smartphone: no ballot leaves the device in physical form, and the judge's own device security protects access to the device. On the technical side, browser local storage is scoped to the application and is automatically overwritten when a new event is loaded. The administrator can delete central server records at any time. I have not established a formal verified clearing protocol, as the threat model differs fundamentally from the paper case. This remains an area to formalize for completeness.

3.5 Identity Protocol

To address the intermittent de-authentication issue affecting some iOS users, the system uses a combination of technical hints and procedural safeguards.

Identity Hint The ballot submission and confirmation pages explicitly display the judge's name (Fig. 5).

Verification Step During the mandatory briefing judges learn to verify their name on the ballot submission receipt. An absent name signals session loss. At that point, judges must reopen their original email link to re-establish their session and resubmit without external intervention. Judges' scores remain available, because they are locally stored.

Currently, authentication links remain valid for the full event day, which is what makes independent session recovery possible: a judge who loses their session can re-open the same link and continue without requiring my intervention. This is a pragmatic choice — without a dedicated on-demand re-mailing system, a long-lived link is the only reliable way to guarantee judges can self-recover. The natural next step is an on-demand flow where a judge requests a fresh authentication link at any point; those links can then be short-lived and single-use.

This verification step is the digital counterpart of Rule 5.I.1.b, which requires judges to sign paper ballots precisely because an unsigned ballot cannot be attributed to a verified judge and is therefore invalid. The same logic applies here: a judge confirming their name on the ballot is a deliberate, visible act of attestation.

The root cause of de-authentication is structural. Modern platforms — iOS in particular — treat session credentials as a privacy surface and may clear them silently between a judge opening their link and submitting their ballot. Privacy defaults are user-controlled, can change between events, and the platform trend is toward more aggressive clearing. Every confirmed de-authentication case in this pilot involved an iPhone.

The alternative — device fingerprinting or cross-session tracking — would work against the very privacy controls that cause the problem, and would impose sustained technical complexity as platforms continue to harden. A procedural control is more appropriate: judges take one deliberate step, voluntarily and transparently, rather than having their identities and devices tracked through covert and invasive means.

4 Development and Iteration History

I developed the e-ballot system through a disciplined iterative process, using each event to surface failure modes and technical friction points in a controlled environment. The approach is to deliberately expose the system to real-world events and pressures, then gather the information to drive the next round of improvements. The goal is to ensure the reliability of the application as a system of record.

I have categorized the development into three strategic phases:

Phase I Foundation & Friction (Iterations 1–2) – Validating the interface and discovering the major issues.

Phase II Hardening & Feature Expansion (Iterations 3–5) – Solving user interface hurdles, adding input alternatives, and registration workflows.

Phase III Area-Level Validation (Iterations 6–7) – Proving the system can handle 12 back-to-back contests in a single event and outperform manual results tally under stress.

4.1 Iteration 1: User Experience Tryout

Date 2026-01-19

Event Regular club meeting — Nuremberg Toastmasters

E-ballot role Open usability tryout for all attendees

Objective Validate core interface and complete ballot collection workflow

Result Identified critical usability conflict and errors under intermittent network connection

I used a regular club meeting as a low-stakes first test of the interface. With no contest and no consequences, every club member could try the ballot and give direct feedback. The goal was to gather broad usability observations and give future contest judges early exposure to the system.

4.1.1 What Happened

I opened the e-ballot judging system to the whole room. Since audience access is built into the system, every member could score the speakers. A handful of members also registered as judges, letting me verify that the judge/audience distinction worked in practice. One of them filed a protest; I received the notification and exercised the chief judge disqualification feature. Both worked correctly.

The core workflow under test was: open the ballot, use the sliders to score each criterion, watch the application compute a running total and generate the final contestant ranking. Finally, submit the ballot.

4.1.2 Findings

Members found the interface intuitive and the layout simple to follow. Two problems emerged.

The first was a scrolling conflict. When navigating a long ballot on a phone, members frequently touched a scoring slider track by accident, causing the score to jump. This frustrated them and demanded extra care when scrolling — an unavoidable action given the number of criteria per contestant.

Second, a logic error in how the backend handles intermittent mobile connections. When a judge submits a ballot, the server records it successfully and then attempts to notify the Chief Judge. Because mobile data connections are often intermittent rather than persistent, this notification would occasionally fail. The system incorrectly treated this "downstream" notification failure as a "user submission" error, returning an alarming message to the judge. The confused judge retried submission. On the second attempt the server correctly replied "ballot already cast" — a duplicate-prevention response — and, since no re-notification to chief judge took place this time, the request completed cleanly. The judge saw a confirmation and moved on. The ballot was already in the database, so the outcome is correct, but the alarming error message confuses the judges and reduces trust in the reliability of the application and the system's integrity.

4.2 Iteration 2: The reality of contest pressure

Date 2026-02-02

Event Club contest — International Speech + Evaluation — Nuremberg Toastmasters

E-ballot role Voluntary pilot; paper remains the authoritative record

Objective Test the system under contest conditions and verify fixes to previous issues

Result Discovered that over-correcting for usability issues can impede judge performance.

The e-ballot system ran as a voluntary pilot alongside the official paper system. Judges were asked to use both and explore whatever workflow suited them — score on paper and transfer to digital, or judge digitally and copy to paper. Paper ballots were mandatory; digital was best effort. Judges were effectively doing the work twice.

4.2.1 Improvements Since Last Event

- The scoring sliders now require the judge to press and hold for 300 ms before the knob activates, preventing accidental score changes while scrolling.
- The chief judge notification is now decoupled from the submission response: a notification failure no longer returns an error to the individual judge.

4.2.2 What Happened

The slider lock proved counterproductive. One judge's phone could not activate it at all — a browser compatibility problem. Several others found it obstructive enough that they abandoned the digital scoring system at some point. After the contest closed, some of the engaged judges told me they had not properly used the sliders for judging. They had simply scored each participant on a single criteria so that they would rank on the final ballot, as their paper record.

Participant registration was disorganized and confusing. As an external organizer I had no advance access to the judge list, nor contestant list. I prepared to quickly register everyone on the day, under an efficient process. Judges however found it strange to be asked to register twice — once per contest. Some opened the registration link in more than one browser; others had their phones refresh the registration request. Whatever the cause, one judge ended up with a duplicate account within a contest, and two contestants were registered twice as well. I deleted the surplus registrations from the admin panel. Cumbersome, but not an issue that affected the contest outcome.

That same judge (with double account) later lost session authentication mid-contest. His ballot for the second contest registered as an audience vote rather than a judge submission. At ballot collection time, because not all judges had submitted digitally and the electronic system did not provide a way to enter paper ballots manually, the system could not produce a live result. I collected all paper ballots after the event and entered them manually. The tally computed correctly, confirming that the core calculation logic was sound.

4.2.3 Findings

The slider lock is the wrong solution: anything that makes the system harder to use than writing on paper will cause judges to abandon it, especially when they are already doing double work. Developing an alternative approach is still needed.

The system, under the idea of allowing audience members to explore how *judging* works, does not have accounts, but participating devices. That is why I was confident about the speedy registration of judges and contestants. Their smartphone is the account, and then the system recognizes them as a judge or contestant depending on the registration type. This approach though flexible, is cumbersome and confusing for participants. It also consumes time which might not be available in larger events. Pre-registration becomes essential. Judges, contestants and other officers must find their account already set upon arrival to the event, reachable via a single personal link.

Two further gaps became clear. Firstly, the transition period from paper scoring to digital requires a manual ranking entry form so judges can submit their final contestant ordering without re-entering all scores. Secondly, the application needs to persist scores locally on the device — a refresh or accidental navigation away from the judging ballot must not clear a judge's work.

4.3 Iteration 3: Reviewing fixes from previous iterations

Date 2026-02-16

Event Regular club meeting — Nuremberg

E-ballot role In-meeting feature validation

Objective Test new features and technical safeguards

Result Approved new scoring slider experience

I used a regular club meeting to validate the application changes from previous iterations. I introduced three new capabilities: a revised slider, a timer role, and local score persistence.

4.3.1 Improvements Since Last Event

- Redesign scoring slider to actuate only when the user presses directly on the knob, not anywhere on the track. No locking mechanism; no conflict with scrolling.
- Scores are now stored locally on the judge's device upon entry. Refreshing the page or navigating away no longer clears records.
- A manual ranking form is available as an alternative to the scoring sliders, letting judges enter their final results directly.
- Timer role added to the system. Includes stopwatch with signal and color timing plus a report submission flow.
- The event is configured in full beforehand; participants register their device via a unique personal QR code rather than a contest link.

4.3.2 What Happened

Members acting as judges tried the new slider. They found it unobtrusive and intuitive — no accidental score changes while scrolling. Given the low stakes of a club meeting, most testing judges defaulted to using the manual input form rather than scoring speakers with the sliders. Their attention was on their member role and giving written feedback to speakers, so detailed scoring was not a priority. Feedback was limited but consistently positive about the changes.

The timer found a slight friction point in edit mode. It was intuitively toggled by pressing the time record, and applied upon pressing somewhere else. It was, however, impractical due to the precision at which the user can press within a mobile screen.

4.3.3 Findings

The slider revision resolves the core usability complaint from Iteration 2. The manual input form gives judges a fast path for completing the ballot while working in parallel with paper ballots. Scores saved locally on the device persist through page navigation: a judge who switches to the agenda or refreshes the page returns to a complete ballot, not a blank one. A pre-configured event simplifies participant registration. The remaining rough edge is in the timer edit interaction.

4.4 Iteration 4: Club Contest — Erlangen Toastmasters

Date 2026-02-18

Event Club contest — Evaluation, Table Topics, International Speech

E-ballot role Pilot alongside paper; paper is authoritative record

Objectives Test end-to-end contest workflow. Validate system usefulness

Results Demonstrated superior results delivery. Revealed critical need for recovery paths.

For this event I had access in advance to the full judge and contestant list. I set up the entire event in the system before the day. All contest officials and contestants had an

account, which activates upon their device registration. I attended as an external observer, with permission to accompany the chief judge into the counting room to compare digital results against the official tally, while monitoring the e-ballot system and supporting its users throughout the event.

4.4.1 Improvements Since Last Event

- The timer stopwatch now has three separate controls: Edit (to manually set a time), Start/Stop/Restart, and Reset. The edit field no longer conflicts with the running display.

4.4.2 What Happened

I joined the judges briefing and registered every judge's device on-site. I also walked judges through a full judging ballot, including attempting submission — which the backend correctly blocked, since ballots only open after all contestants have spoken. That moment made something clear: the judges briefing needs a dedicated practice item on the agenda where the chief judge explicitly opens a test contest and judges submit a ballot. Without it, judges arrive at the real contest without having experienced the entire workflow.

I joined the contestants briefing to register them too. This registration is only necessary for them to be able to file protests. The system has a contest chair view for randomizing the speaking order; once the chair confirms it, every participant's device displays the official lineup immediately.

As the contest started I realized two serious mistakes. I misconfigured the first contest, labeling it as International Speech when it was the Evaluation contest. Judges received the wrong judging criteria, the timer's signals were wrong, and the automatic overtime disqualification triggered — because Evaluation speech time limits fall below the International Speech minimum, all contestants were automatically disqualified. My second mistake: I did not have administrative access to the server running the application to correct the configuration error on-site.

The second and third contests — Table Topics and International Speech — were correctly configured and ran without incident from the server side.

On the application side, one judge's ballot displayed score totals stuck at zero — a display update failure. Switching to a standard browser resolved it immediately. During the Table Topics contest, one judge lost session authentication. The chief judge's live dashboard showed his ballot missing. I located the judge, issued a new authentication link via QR code, and because his scores were stored locally he could resubmit immediately without re-entering anything.

The digital system adds minimal overhead to the judges' workload, whether they judge directly on the application or score on paper and transfer their ranking. Ballot collection is slightly faster: judges submit digitally and the chief judge monitors progress in real time. The system's clearest advantage is result delivery — the moment the last ballot arrives, results are ready.

As previously mentioned, the evaluation contest failed entirely: the misconfigured timing limits triggered automatic disqualifications for every contestant, and the system offered no way to undo them. For both Table Topics and International Speech the digital and paper

results were identical. Paper counting took 7 minutes for 3 contestants on International Speech (including one timing disqualification). Table Topics with 6 contestants took 13 minutes: the counters had difficulty reading one judge's handwriting, and a transcription error by one counter forced a full re-audit. The digital result was ready the moment the last ballot arrived. No protests were filed.

4.4.3 Findings

Never attend an event without the means to access the server for an administrative manual intervention. Wrong configuration of an event with no recovery path turns into a complete failure of the system.

The chief judge must be able to manually override automatic disqualifications. Contest rules include a 30-second grace period if the signal timer fails to signal — the system must reflect that flexibility. In general, the chief judge needs an undo action for any state change triggered by error/accident.

A practice item on the judges briefing schedule is non-negotiable. Judges must complete practice ballot — including ballot submission — before the contest begins, to ensure knowledge of the application and verify all systems are operational.

Two further gaps surfaced: first, judges need immediate feedback on any network-bound action (two judges reported that pressing submit appeared to do nothing, where the actual cause was their slow mobile connection). In a digital system, users interpret *silence* from the User Interface as failure. Second, the timer wanted a cleaner control model where an accidental second press on Start button pauses rather than resets the stopwatch. Reset action shall be an independent button.

4.5 Iteration 5: In-Meeting Test — Bamberg Toastmasters

Date 2026-02-23

Event Online club meeting — Bamberg

E-ballot role Discoverability test; no contest

Objective Verify judges can use application without direct instruction

Results Confirmed interface is independently navigable

Bamberg Toastmasters belongs to a neighboring area and some of its members might judge at the upcoming area contest. I ran an online test to expose them to the system early. Unlike previous tryouts, I was not testing new features — I was testing independent discoverability: could judges open the application and complete the workflow from written instructions alone, without me guiding them in person?

4.5.1 Improvements Since Last Event

- Every button press now produces immediate visual feedback.
- A progress bar appears during ballot submission, giving judges a clear signal that the application is working while waiting for a network response.

- UI feedback changes verified for cross-browser compatibility across standard mobile browsers.

4.5.2 What Happened

All participants opened the application from instructions alone, navigated the ballot without prompting, and submitted successfully. I monitored their submissions live. The system returned the result when all ballots were in.

4.5.3 Findings

The interface is independently navigable. Judges with no prior exposure completed the full workflow without guidance — a meaningful result ahead of the area contest. One participant asked, after submitting, to see a reminder of what he had voted. The application showed only a confirmation message; judges could not retrieve their submitted ballot.

4.6 Iteration 6: Area D5/D6 Contest — Full Digital Deployment

Date 2026-03-07

Event Area D5/D6 contest

Contests 12 (6 German-language, 6 English-language)

Chief Judge Dave Sukowatey (all 12 contests)

E-ballot role Sole system of record; paper as backup

Judges 6 throughout morning section; 7–8 in afternoon section

Contestants 43 (45 registered; 2 withdrew on event day)

Objective Prove the system can handle a 12-contest event as the primary authoritative system of record

Result Successful integration, system ran reliably and event was on schedule. Identified a persistent issue on some judges iOS devices.

This was the first event where the digital ballot was the authoritative system of record. Paper ballots were available as a fallback in case of unrecoverable system failure, but the expectation — based on all prior testing — was that the digital system would run unassisted throughout. Judges could still judge on paper by their preference, but had to transfer their final contestant ranking to the application and submit the ballot digitally.

4.6.1 Improvements Since Last Event

- Timer controls are now fully separated: Start/Pause/Continue on one button, Reset as an independent action. An accidental double press on Start pauses or continues rather than clears the stopwatch. Manual edit is always available and independent.
- A new authentication model separates user identity from session/authentication tokens. Participants have a stable identity in the database; sessions are issued on device registration and tracked independently. By separating identity from authentication it is simpler to track participants within the system setup, while assigning

them roles within the event. It also allows sharing authentication links with participants which are single use, or with expiration time instead of representing the sole identifier of their identity and device.

- An agenda generator handles event scheduling. With 45 contestants across 12 contests, computing and adjusting start times, buffer periods, and briefing slots by hand was impractical. The generator produces a full schedule, including contest length given by contestant number, when needed test speaker time, buffer breaks and scheduled breaks, award ceremony and judges briefing practice contest.
- A mailing system sends each participant their personal authentication link before the event, letting them verify their registration and role assignment in advance.
- An admin view lists all registered participants by contest, for pre-event verification, and a quick way to find participants contact information.
- "Ballot Reminder" view: Judges can now see a read-only summary of their submitted rankings after the fact.
- Administrative "Undo" controls for the Chief Judge to override disqualifications.

4.6.2 What Happened

Preparation. I set up the entire event in the system: all contests, all participants with their matching roles for each contest. Every participant received their personal authentication link by email the night before.

Judges Briefing. At the briefing I authenticated every judge, and ran a full practice instance: judges scored a fictional contest and submitted a ballot. Each judge also learned to file a protest. The chief judge advanced the practice contest through each state and monitored the live dashboard to track ballot submissions. The timer tested the stopwatch on his device and submitted his report. Every contest officer completed a full workflow during the briefing, confirming that all features were available and operational. The event comprised two sections — German-language and English-language — each with 6 contests: International Speech, Evaluation, and Table Topics for each of Areas D5 and D6. A full briefing and practice run took place before each section.

Contestant briefing. Before each section the contest chair ran the contestant briefing and used the randomization feature to set the speaking order. The order appeared immediately on every judge's device. Because the event was pre-configured in the system, this was the only setup cost at the briefing. Judges using paper ballots appreciated having contestant names and speaking order ready on their device — on paper, delivering that same professional experience requires the speaking order to be finalized well in advance, ballots to be individually prepared per contest, and a full print run completed before the event. That overhead is prohibitive at scale, so in practice paper ballots arrive blank and judges write names on site. Digital randomization can happen at the last moment — after confirming which contestants are present, as we had withdrawals on the day — and every device receives the confirmed order instantly.

Morning section. The six German-language contests proceeded without incident with the same judging team(5 judges + tiebreaker) remaining consistent over all the contests. Although we started slightly behind schedule, we recovered across the morning and

reached the lunch break on time without rushing. After each contest, all ballots arrived within 65 to 113 seconds of the final speaker (average: 101.6 seconds). The chief judge announced "all ballots are in" and adjourned each contest without leaving the room or waiting for paper to change hands. No protests were filed.

Afternoon section. The English-language contests posed more challenges. The judging panel was larger — seven to eight judges in total — with planned rotations across contests to accommodate judges' time availability. Timer teams also rotated. All changes were deliberate and configured in advance; the system is designed to track each participant's specific role per contest independently, and handled the rotating assignments without issue.

Three judges — consistently the same three individuals — lost session authentication at various points during the afternoon, sometimes on subsequent contests. I identified that all three were iPhone users. The chief judge's live dashboard immediately revealed whose ballot was missing after each contest. Each time, I located the affected judge and issued a new authentication link via QR code — the original single-use link was spent on first access and could not be reused for recovery. Because scores remain stored locally on the device, the judge could resubmit without re-entering scores. My active monitoring prevented any ballot from being permanently lost into an anonymous audience submission. Ballot collection took longer, as I had to visit each de-authenticated judge in person; collection times ranged from 79 to 224 seconds, with an average of 157.8 seconds. The chief judge adjourned each contest upon full ballot collection. No protests were filed.

The de-authentication failure created a specific confusion: the system delivered the same "ballot submitted" confirmation whether the submission was authenticated as a judge or as an anonymous audience member. Affected judges believed they had voted correctly; only the chief judge's live monitoring exposed the discrepancy.

End of event. Before the award ceremony, the chief judge wished for a single consolidated results view across all 12 contests to prepare certificates and the Contest Chair's report. He had to open each contest individually to collect the results.

4.6.3 Findings

The system carried a 12-contest, 43-contestant area event as the authoritative record without a single fallback to paper, requiring only targeted intervention. Every ballot was collected and every contest was adjourned promptly. The operational gains were tangible: no waiting for paper collection, no counting fatigue, no arithmetic errors. The event remained on schedule throughout.

De-authentication — observed consistently across the same three iPhone users throughout the afternoon — emerged as the e-ballot clearest open risk. The pattern was pernicious: recurring, hard to predict, and invisible to the affected judge, who believed they had voted correctly. My active monitoring was the only mechanism that caught each case; without it, those ballots would have been lost to anonymous submissions. Targeted intervention every time is not a sustainable solution. The root cause needs to be understood, and judges must be able to detect and recover from session loss independently.

Judges responded positively to the digital system and were particularly thankful for the additional assistance it provided to their job. The feature judges praised most was having the speakers' full names and the speaking order readily available at their fingertips.

One judge who preferred paper cited the tabular layout as his reason: paper lets him compare all contestants' scores side by side, while the digital scoring view presents one contestant at a time.

The chief judge was particularly pleased with the real-time submission status view. Complete ballot collection meant results were ready — no counting step intervened — allowing him to adjourn each contest immediately and with confidence.

Signaling timers were equally positive. Each contest type carries its own speech duration and corresponding signal times; tracking those across consecutive contests is a non-trivial cognitive burden. That the rulebook includes a dedicated clause for handling an incorrect signal suggests the error is common enough to warrant it. The application's color-coded cues prompt the signaling timer at the correct moment, eliminating that class of error entirely.

The e-ballot system accelerates time to results and eliminates the errors that fatigue produces — in ballot counters and contest officers alike.

4.7 Iteration 7: Area D2/D3 Contest — Parallel Validation

Date 2026-03-14

Event Area D2/D3 contest

Contests 12 (6 German-language, 6 English-language)

Chief Judges Kumar Barua (English contests) · Kilian Schroth (German contests)

E-ballot role Parallel validation; paper is authoritative

Judges 7–8 including tiebreaker

Contestants 35

Objective Validate the system against a prepared ballot counting team in a similar high-volume contest event

Result Confirmed speed advantage over manual tally. Counting team fatigue documented. Session de-authentication on iPhone substantially reduced by a targeted technical fix; residual cases traced the cause to platform-level privacy behavior.

Given my proximity to these areas and a newly implemented fix for the iPhone de-authentication issue, I proposed running a parallel validation. Since this was an unplanned addition, the paper ballot remained the authoritative record and judge participation was on a best-effort basis. The goal was to validate the system's speed and accuracy advantage, and to test its portability to an environment where participants had little prior exposure to it.

4.7.1 Improvements Since Last Event

- Implemented a standard platform mitigation for iOS session credential clearing.
- Authentication links changed from single-use to long-lived, valid for the full event day. A judge who loses their session can reopen their original link and recover independently without organizer intervention.

- Ballot submission message includes judge's name. This makes judge aware, in case de-authentication happens and learn about the identity protocol (§ 3.5).
- A tabular judging view is now available in the ballot, letting judges score all contestants side by side on a single screen.

4.7.2 What Happened

Briefing and preparation. I joined the English contest judges briefing and introduced the system, yet I did not have enough time for a full test run with all the judges, let alone explain the three judging options: individual contestant, tabular view, manual ranking input. For the German contests briefing I did not have time to present the system to the judges. The chief judge explained to the judges that the digital system would run in parallel on a voluntary and best effort basis. For the digital system, this would be test on how intuitive it is to use under no instruction.

English contests. All judges completed the double workload: judge on paper, then transfer their ranking to the digital ballot. Every English contest had complete digital submission. Timer used the application stopwatch and submitted records digitally too. With judges doing double work, filling up paper and digital ballots, the digital ballot collection completed within 120 seconds (fastest) to 299 seconds (slowest) with an average of 203.4 seconds.

German contests. Only about half the judges participated. The rest did not engage with the digital system. Nullifying digital Ballot collection time.

Counting room. The event's procedure segmented each contest type by area, instead of individual contest per area, to optimize for time resources. Here D2 speakers went first, judges completed their ballots, collectors gathered them, everybody remained in the room; then D3 speakers, and the same operation. Only then a contest concluded, and ballot counters, the chief judge and I left toward the counting room with the entire paper ballot sets. To tally the ballots the two counters worked in parallel — one per area — before swapping places to audit each other's tally. I sat in the counting room and used the digital system as an independent audit.

At this large event, the counting team's fatigue was visible. Error rates climbed with each successive contest. Counters openly told each other they were losing confidence in their tallies, and the mutual audit rounds grew longer as the event progressed. Both the German and English counting teams showed the same pattern independently. For the German contests where not all judges had submitted digitally, I authenticated myself as each absent judge to enter their paper ballot — an admin workaround only I can use. Even entering ballots manually in this way, and only after the counters had already processed each ballot so as not to interfere, I reached a digital result seconds ahead of the paper tally in every case. The speed advantage came not from computation but from the structured input form: the Toastmasters paper system inverts ranking order across three different documents — the judge ballot, the tally sheet, and the announcement form — forcing counters to track the direction of each inversion rather than working with a consistent format.

Digital results matched the paper records in every contest. Neither protests nor ties took place. The following table records the times to exclusively tally results in the counting

room. There is no account on the time for ballot collection, reaching the counting room and setting up, filling forms and returning to the event room.

Contest	Contestants	Judges	Tally
EN Evaluation	2 + 2	7	7min
EN Table Topics	3 + 2	6	5min
EN Speech	4 + 3	7	11min
DE Evaluation	3 + 3	7	8min
DE Table Topics	3 + 3	7	11min
DE Speech	3 + 4	7	16min

4.7.3 Findings

The parallel validation confirmed digital accuracy across 12 contests: every result agreed with paper. That agreement reassured ballot counters, especially at the later stages. As if roles had inverted and digital was confirming paper.

The fatigue pattern in the counting room makes the argument for digitization more concretely than any previous event. The fatigue was consistent, independent across two separate counting teams, and worsened predictably with each successive contest. The system neither gets tired nor makes arithmetic errors — not after three hours of contests, not after ten.

Judges with no prior instruction, particularly under time pressure, did not explore the interface. None discovered the tabular view independently; several who had judged on paper transferred all their scores through the full scoring interface rather than using the faster manual ranking form — simply because no one had shown them it existed. The briefing practice item is not merely helpful: it is the only way judges know to access the system's full capability.

Judge de-authentication surfaced only twice across the entire event, in strong contrast to a recurring pattern in the afternoon of Iteration 6. The technical fix closed the most prevalent class of session loss; the residual cases showed another class remained. I concluded that the appropriate control is procedural rather than purely technical, which led me to formalize the identity protocol (§ 3.5) — the digital counterpart to the paper-ballot signature requirement (Rule 5.I.1.b). Both affected judges recovered on their own using their pre-event email link, a meaningful improvement over requiring my intervention.

Judges were again most enthusiastic about having contestant names and speaking order available on their device. The rest of feedback revolved around additional information hints. Firstly, because these contests always had two contests actively highlighted, judges wanted an additional hint in the agenda view marking which contest they had already cast a ballot for. Secondly, judges wanted all scoring hints. The digital ballot uses a colored slider, but one judge missed the named ranges from the paper ballot.

Timer wished for larger action buttons under the justification he watches the speaker and is not guaranteed his finger would press the correct spot on his phone. He also wished for a second timer to track the minute judges have after a contestant speaks.

5 Assessment

I have evaluated the system's performance against the traditional paper process across seven events. My observations confirm that while the digital transition requires a shift in preparation, the operational benefits — particularly at high-volume events — are definitive.

5.1 Strengths Demonstrated

Speed The Chief Judge can adjourn a contest within two minutes of the final speaker. Across twelve back-to-back contests, this eliminates an estimated two hours of dead time — ten minutes per contest for physical collection and manual counting is already a conservative baseline at this event scale.

Consistency under load At large events with multiple back-to-back contests, human ballot counters grow fatigued and error-prone. The e-ballot system produces the same quality of output regardless of how many contests have preceded it.

Auditability Every ballot in my system is timestamped and linked to a verified judge identity. This removes the ambiguity of "unreadable handwriting" witnessed in some counting rooms.

Adoption Judges across ability levels used the system successfully, particularly after a structured briefing.

5.2 Limitations and Remaining Risks

Judge briefing is non-optional despite an intentionally simple interface, judges who encounter the system for the first time without any introduction face a learning curve, and the contest time pressure does not give them time to "explore" and familiarize themselves with the interface and options. They only manage to use the scoring view, because it is the first one available. A structured briefing and a complete judging practice round before contests begin become mandatory for reliable use. Event planners must build this in as a fixed time cost.

De-authentication issue platform privacy controls may silently clear a judge's session between opening their link and submitting their ballot. Observed cases have involved iPhone users exclusively, but as platforms continue to harden on privacy this is not inherently an iOS-specific risk. The identity protocol (§ 3.5) addresses this directly: judges verify their name on the confirmation screen and, if it is absent, reopen their email link to recover independently. De-authentication is therefore a manageable procedural step, not a technical risk which would need invasive tracking to address.

Connectivity dependency Every participant must have a smartphone with network connectivity and sufficient battery. In practice this is not a meaningful constraint — every participant across the entire pilot carried a personal device with a data plan. The application is lightweight on battery and data; even the timer, whose screen stays active throughout each contest, reported no issue. At venues that offered WiFi, judges defaulted to their personal data plan without prompting and without difficulty — the application is lightweight enough that mobile data is entirely sufficient, joining an unfamiliar network is an extra configuration step, and

some participants may prefer not to connect to a network they do not control.

5.3 Comparison with Paper System

I have summarized the operational differences below. My findings show that the E-Ballot system trades "up-front" preparation time for "end-of-day" speed and accuracy.

Criterion	Paper System	E-Ballot System
Accuracy	Degrades with fatigue. errors increase with event length	Deterministic immune to cognitive load
Time to results	Minutes to tens of minutes	Immediate upon last submission
Chief judge workload	High (collect, count, verify)	Low (monitor dashboard, manage event flow)
Audit trail	Paper trail, manual	Timestamped digital log
Judge setup	Printed ballots	Briefing + practice time
Device/connectivity needed	No	Yes

5.4 Speed to Results: The "Manual Tally" Comparison

The primary argument for digitization is the elimination of "dead time" and human counting fatigue. In parallel testing at Iteration 4 and Iteration 7, the digital system consistently outperformed manual teams.

Manual tallying took between 5 and 16 minutes — counting-room time only, excluding physical collection and the walk to and from the room — due to illegible handwriting, required re-audits, and counter fatigue.

Digital results were ready within 1–3 minutes of the final speaker, the time required for judges to finalize and submit their ballots.

6 Recommendation

Based on the evidence I gathered over seven iterations, I recommend the adoption of this E-Ballot system as the authoritative system of record for Toastmasters speech contests. I have proven that it outperforms paper-based tallying in speed, accuracy, and resilience to human fatigue.

I make this recommendation contingent on the following conditions:

1. **Mandatory judge briefing**: Event planners must reserve time before each contest for a structured briefing and practice session. The quality of the judging experience depends on it.
2. **Identity-protocol briefing**: Judges must receive clear instruction to verify their name on the confirmation screen and reopen their email link if it is absent. The identity protocol (§ 3.5) is the digital counterpart to the paper-ballot signature requirement (Rule 5.I.1.b) — the judge's deliberate confirmation of their identity on the ballot. This makes de-authentication a self-recoverable procedural step. Its

effectiveness depends on informed judges, with the chief judge's submission monitoring serving as a natural cross-check.

3. **Administrative manual modes**: A successful event requires the flexibility of manual overrides. The chief judge must be able to undo disqualifications; judges must be able to enter their final ranking directly. Trusting the integrity of contest officers is a sounder approach than restricting every action technically or building exhaustive permission layers around each one.
4. **Continued incident tracking**: the first seasons of full digital operation should include structured logging of any technical incidents, to build confidence and support continuous improvement.

I take full responsibility for the technical integrity of this system and I am confident it will significantly improve the contest experience for both officials and participants.

7 Path Forward

I built the e-ballot system to solve a concrete problem: the administrative ceiling that manual paper processing imposes during a high-load, back-to-back contest day. The results answer that question. The system operated as the sole system of record across twelve consecutive contests, and this report documents the evidence for its operational soundness.

Success in my hands, however, settles only part of the question. For the system to receive broad adoption, a different organizer must configure and run an event independently, and the procedural and technical protocols must hold across a wider range of venues, panels, and devices. Division and District contests are the appropriate proving ground for that.

For this next phase, the digital system can serve as the authoritative record — the evidence across seven events supports that choice. Paper records must remain available as a backup system due to the testing nature of a pilot program and that upcoming events open new unknowns. The district spans multiple countries and I cannot be on-site at every event to provide support, organizers new to the system need a familiar fallback while they learn and test the system. Additionally, some judges prefer the mixed workflow: score on paper then submit digitally.

7.1 What the Next Phase Would Prove

Two open questions from this pilot require higher-stakes testing to resolve:

1. **De-authentication**: The technical mitigation I introduced in Iteration 7 reduced the incidence significantly, but did not eliminate it. The identity protocol (§ 3.5) contains the impact of session loss, making it a recoverable procedural step rather than a hard technical failure. Larger and more diverse judging panels at Division and District level will provide broader exposure to the range of platform configurations, and will validate that the protocol holds across that wider surface, without becoming a burden.
2. **Independent event administration**: Throughout this pilot I personally configured every event and provided on-site technical support. The missing validation is

a different organizer setting up and running a Division or District event independently: registering participants, assigning roles per contest, generating the schedule, and sending authentication links. On event day, the chief judge runs the extended briefing, manages the live dashboard, and announces results without the developer present. That is the step I must complete before I can responsibly share the system beyond District 95.

7.2 Path to Broader Availability

My goal is not to maintain exclusive control of this system. The path to making it available to any Toastmasters organizer who wants it runs through two remaining steps:

1. **Complete the administrative interface**: Currently, I set up every event by accessing the database directly. A self-service organizer interface — for configuring contests, registering participants, and assigning roles — is the prerequisite for independent use. Division and District events will put this interface to the test under real conditions with independent operators.
2. **Establish certification criteria**: Based on the accumulated evidence from this pilot and the proposed next phase, I am prepared to work with World Headquarters to define what a certified electronic ballot system looks like — what technical and procedural conditions it must meet to be approved at any level of competition. This report contributes to that conversation.

I share this report openly; it is available to any District, Division Director, organizer, or WH staff member evaluating electronic balloting. The findings — successes, failures, and open issues — are on the record.

8 Conclusion

I developed and validated the e-ballot system through a deliberate, evidence-based process. From the initial tryout through club-level tests and on to area-level deployment, each phase refined both the system and the operational procedures around it.

The case for adoption is clear: the system is faster, more consistent, and equally auditable than the paper process it replaces. Human fatigue — an underappreciated but real factor in the quality of results at large, multi-contest events — disappears entirely. The remaining risks are understood and addressable.

Modernizing to digital ballots is a natural and overdue step for Toastmasters contest administration. This report provides the evidence base to take that step with confidence.

Appendix

A: Application Visuals

The Judge's Ballot

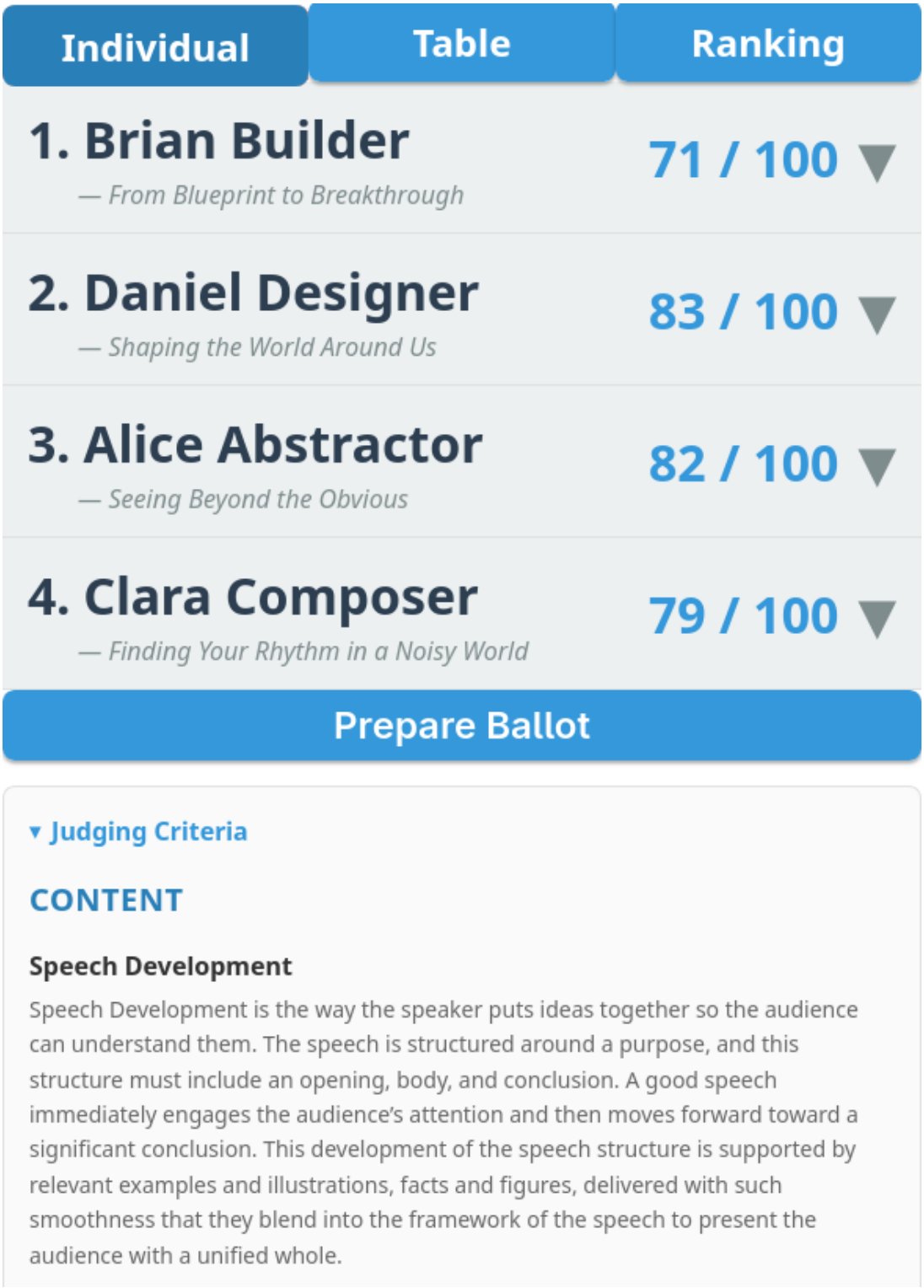

Figure 1: Judges ballot in collapsed state. It list all speakers, with speech title and their total score. At the bottom of the page is the full description of the judging criteria as in the official ballots.

Figure 2: Individual contestant judging view provides a convenient user interface by the use of slider to the judge to score each participant across every judging criteria from the official ballot. Hints on the suggested value points remain marked on the slider. Application adds all individual scores in real-time.

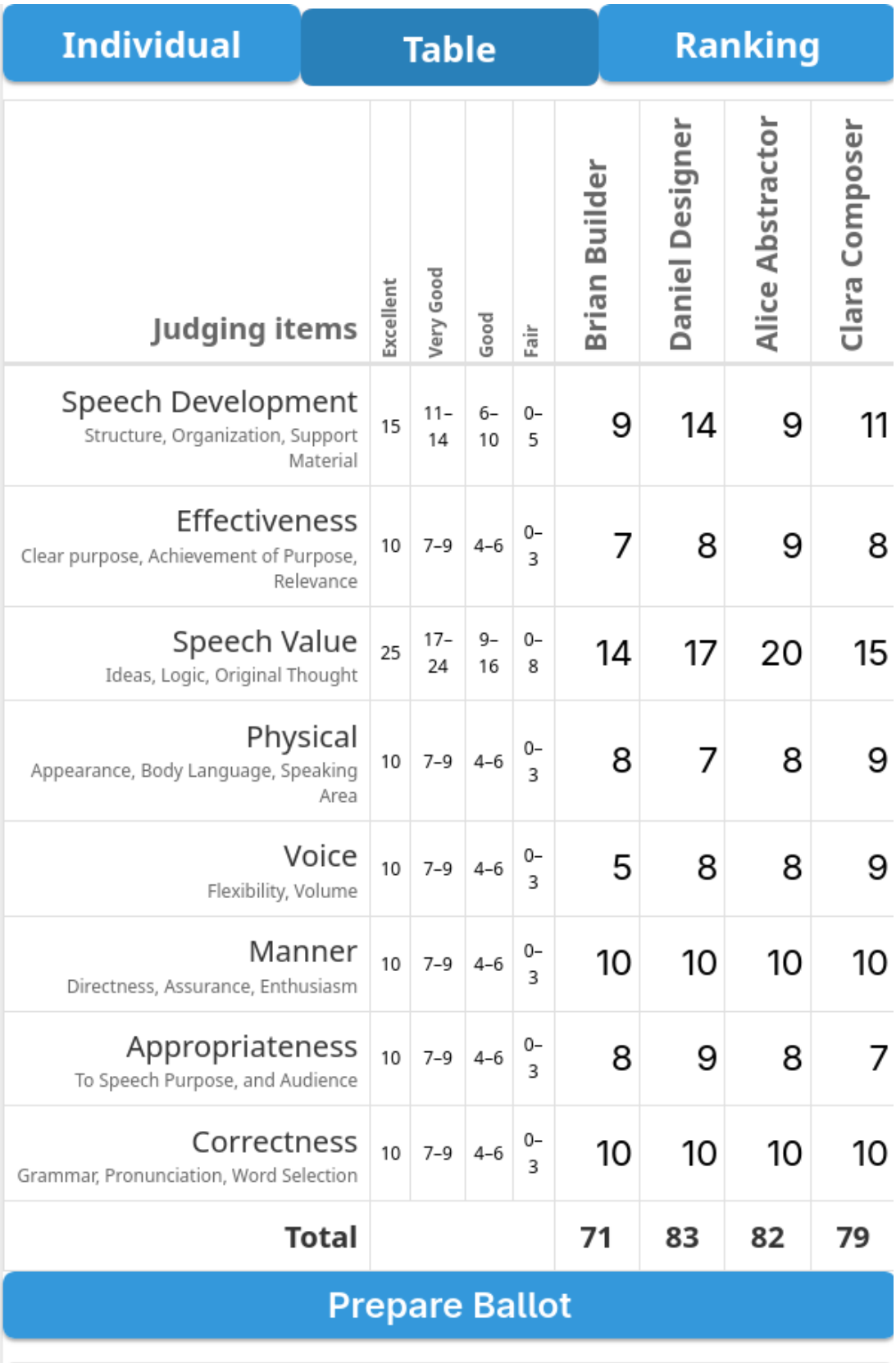

Figure 3: Alternative tabular judging view. It reproduces the official ballot in layout and content. Entirely editable, judges can set the score value on each cell. Application adds the total in real time and controls scores assigned are within the range.

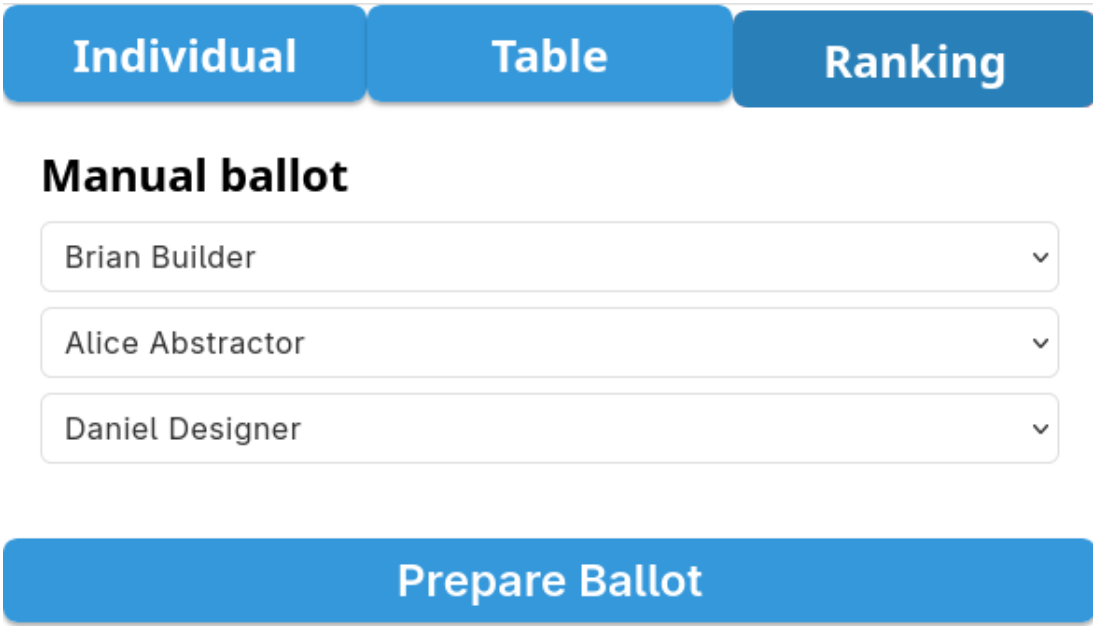

Figure 4: Manual ranking view. Judges set the final contestant ranking directly without entering criterion scores. Intended for judges who scored on paper and need only to transfer their final ordering to the digital ballot.

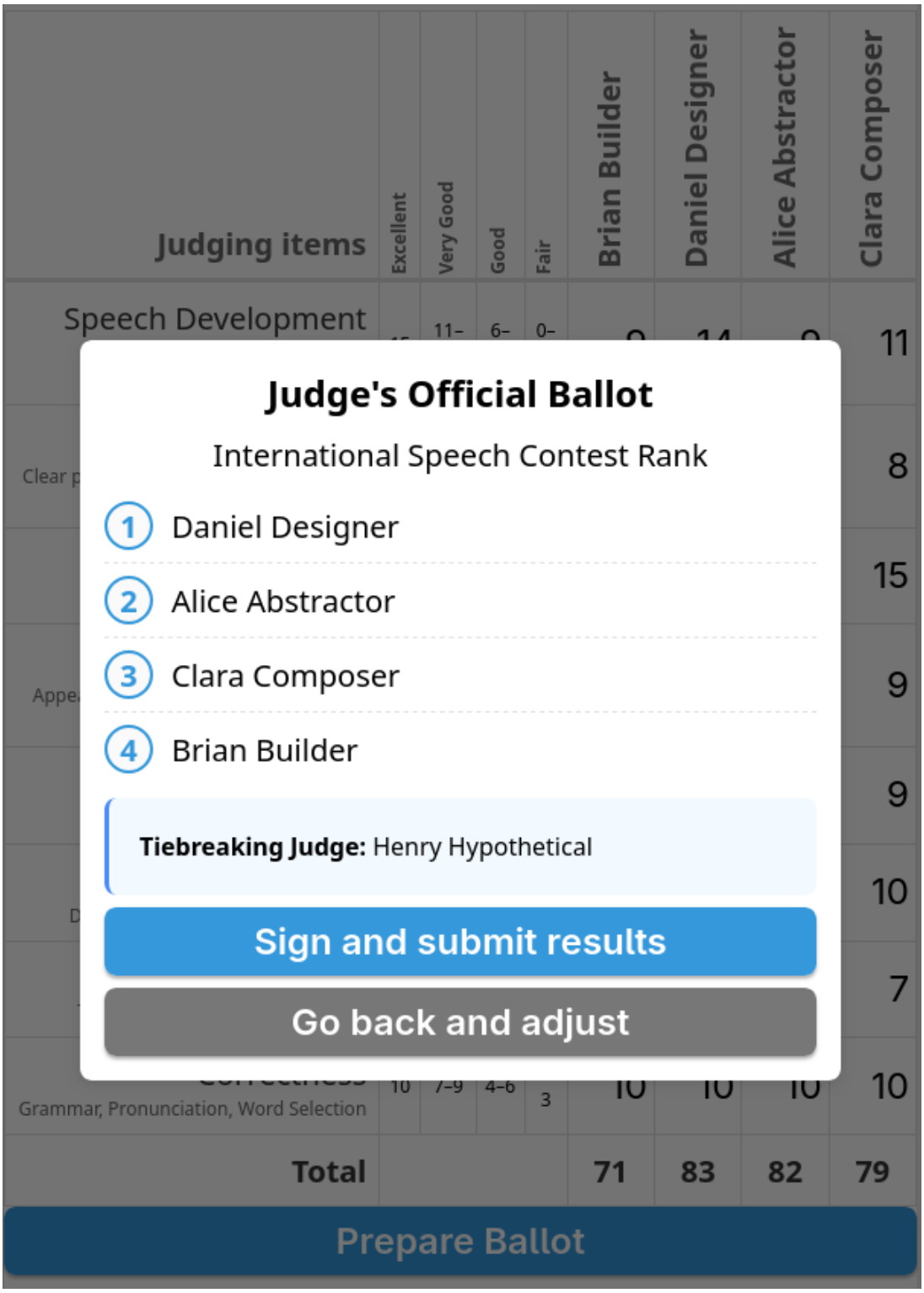

Figure 5: Ballot submission modal. Includes the final contestant ranking and the judge's name, consistent with the identity protocol (§ 3.5). In the particular case of the Tiebreaking Judge, it includes each contestant rank as shown in the image; for a voting judge only the top 3.

The Chief Judge Dashboard

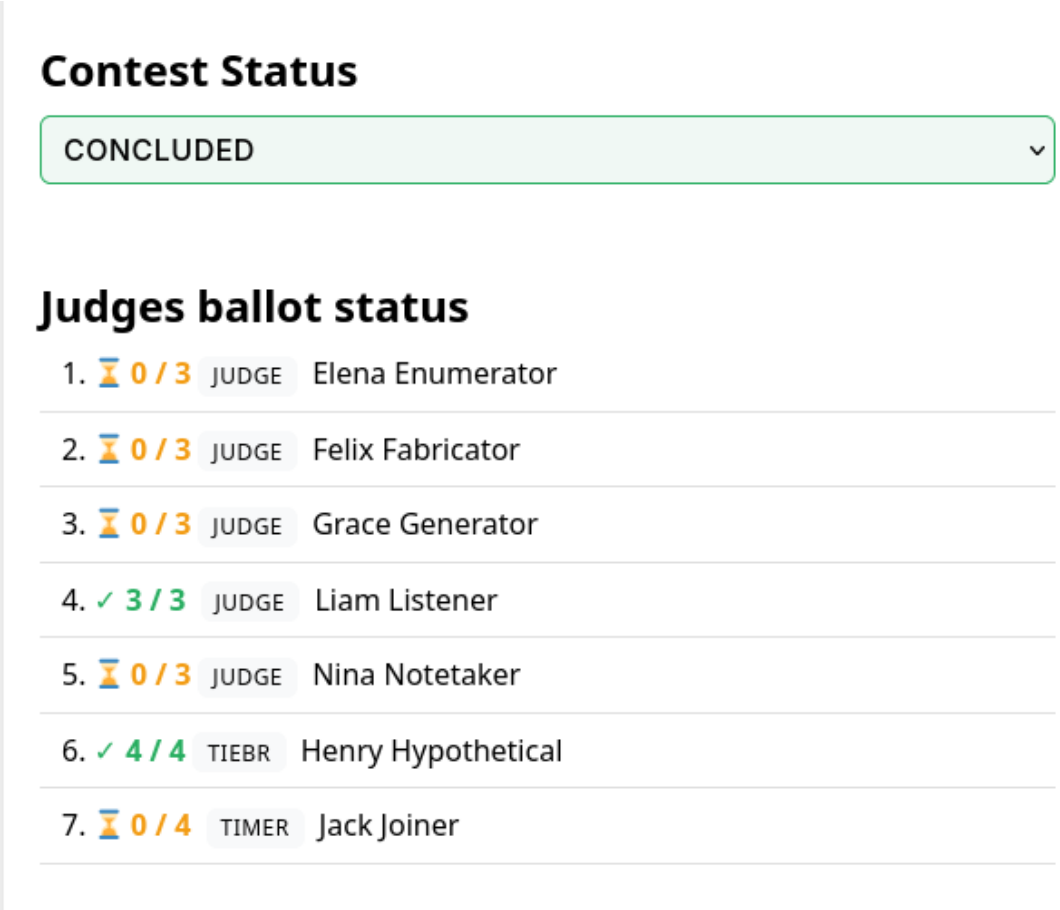

Figure 6: Chief judge contest view. After setting the contest state to concluded, he monitors the ballot submission in real time. Hour-glass and yellow count means still waiting for judge to submit a ballot. Check-mark and green count means ballot received. Notice how the count for a voting judge refers to the top 3 contestants, while the tiebreaking judge as well as the timer submit data about each contestant.

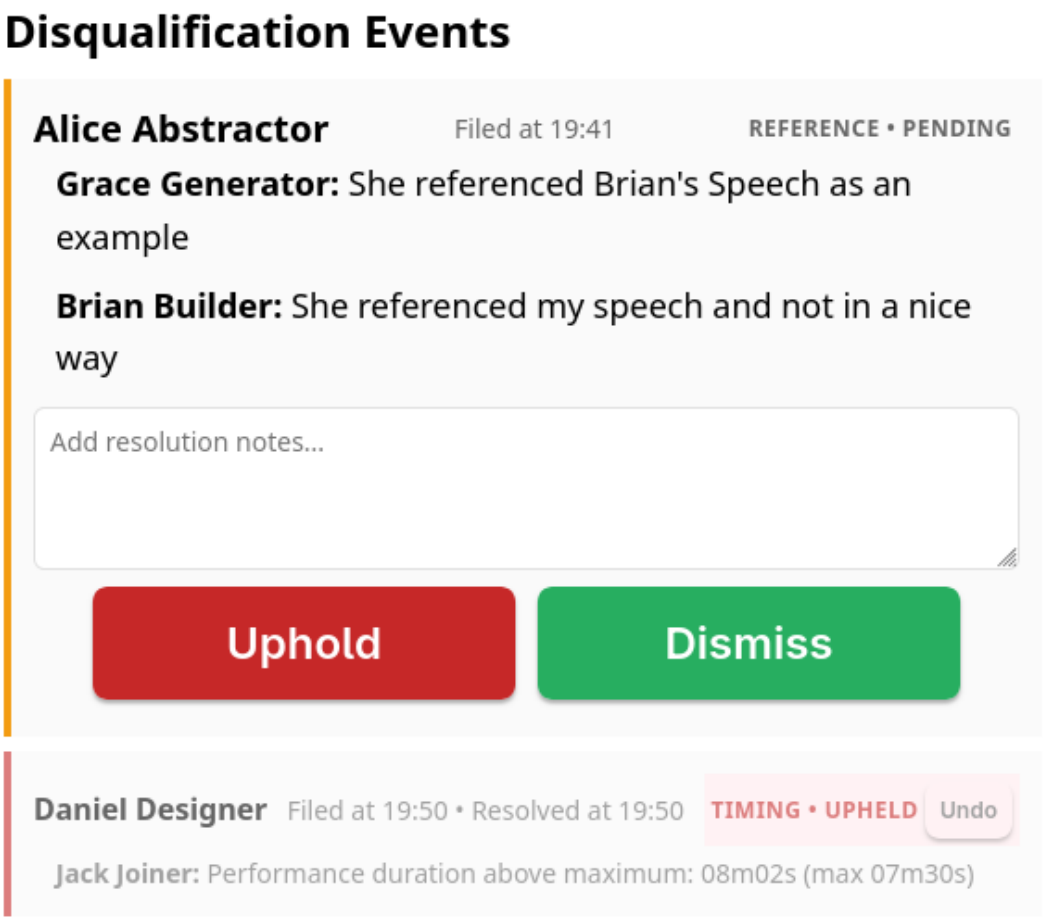

Figure 7: Chief judge receives all protests grouped by contestant and type, so when more than one participant files a protest against the same contestant on the same ground the chief judge resolves the case once. Upholding a protest immediately disqualifies the contestant. The timer report triggers automatic disqualification if speaking time was out of bounds. The chief judge can undo any disqualification.

Timer Module

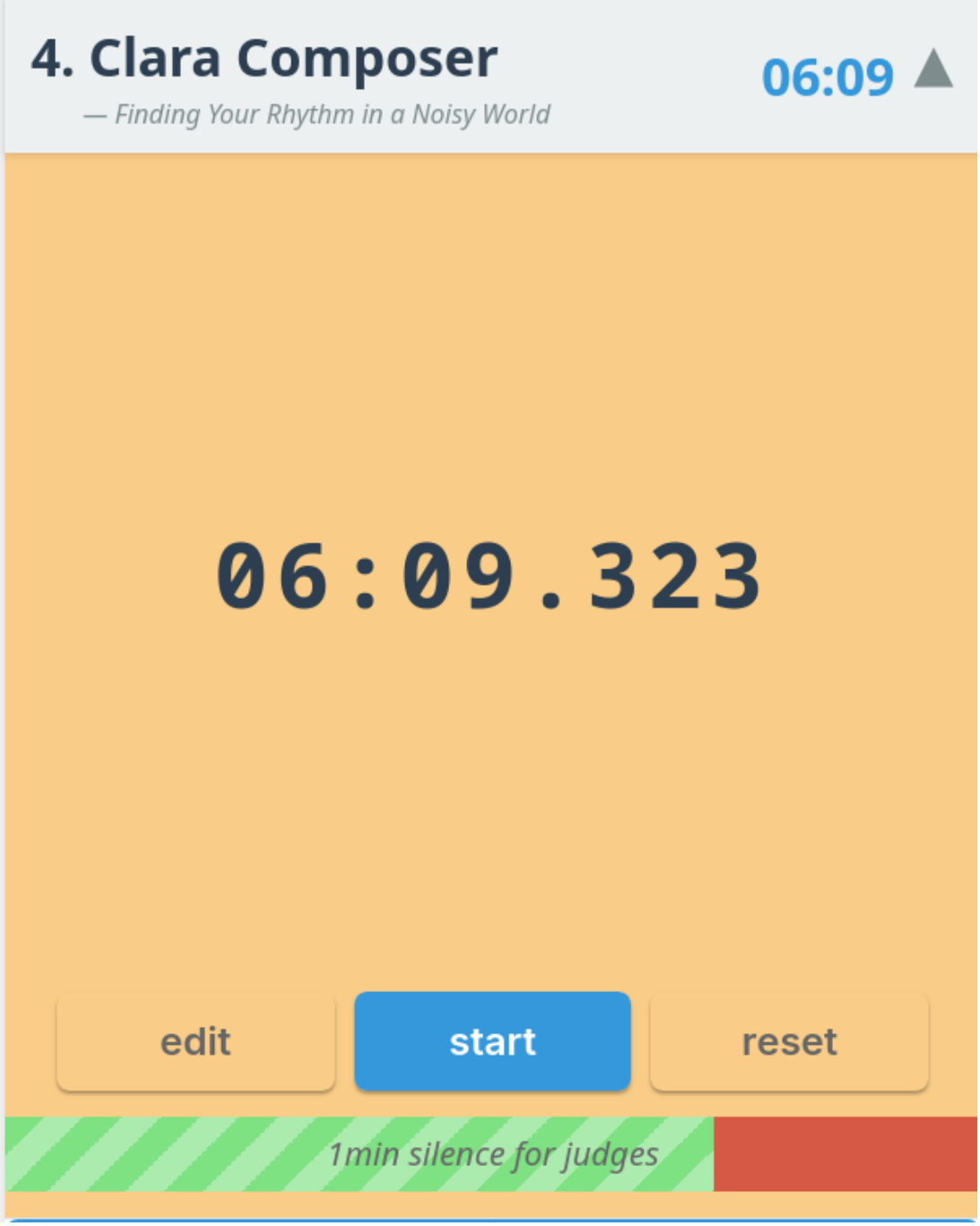

Figure 8: The timer module lists all contestants. Selecting a contestant from the list reveals a dedicated stopwatch, large enough to read at a glance. The background changes color to match the Green, Yellow, Red signaling alerts. `Edit`, `Start/Pause`, and `Reset` control buttons appear at the bottom. The stopwatch records time to millisecond precision. The submitted report truncates to whole seconds as specified by the rulebook.

B: Issues and Feature Request Log

The table below tracks every technical and usability issue identified across all events, the iteration where it first appeared, and its current resolution status.

Issue	First observed	Resolved in	Status
Slider/scroll collision	Iteration 1	Iteration 3	Resolved
Backend notification error on submission	Iteration 1	Iteration 2	Resolved
Slider lock — incompatible/obstructive	Iteration 2	Iteration 3	Resolved
On-site registration / duplicate accounts	Iteration 2	Iteration 4	Resolved
No manual ranking input form	Iteration 2	Iteration 3	Resolved
No local score persistence	Iteration 2	Iteration 3	Resolved
Timer edit/display conflict	Iteration 3	Iteration 4	Resolved
No network progress feedback	Iteration 4	Iteration 5	Resolved
Timer start/reset conflict	Iteration 4	Iteration 6	Resolved
Post-submission ballot reminder absent	Iteration 5	Iteration 6	Resolved
No tabular ballot view	Iteration 6	Iteration 7	Resolved
Chief judge: no disqualification undo	Iteration 4	Iteration 6	Resolved
iPhone session de-authentication	Iteration 6	Iteration 7	Mitigated
De-authentication invisible to judge	Iteration 6	Iteration 7	Resolved
No consolidated results view (chief judge)	Iteration 6	—	Proposed (event organizer)
Scoring hints absent from digital ballot	Iteration 7	—	Added
Timer action buttons too small	Iteration 7	—	Added
Timer lacks judge 1-minute countdown	Iteration 7	—	Added
Ballot cast status on agenda	Iteration 7	—	Added