CLINICAL MICROBIOLOGY – SETUP & WORKUP

CLIENT ADVISORY GROUP SUMMARY

RESEARCH SYNTHESIS

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Understanding Microbiology workflows through ongoing collaboration with client laboratory organizations

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PURPOSE

Understand and validate current Microbiology workflows across multiple client laboratory organizations, identify recurring workflow challenges, and establish the findings needed to inform workflow requirements, system architecture, and future design decisions.

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CONTEXT

Clinisys needed to support Clinical Microbiology within a task-based Laboratory Management System originally designed for Environmental laboratories. Although both domains involve microbiology testing, they organize, prioritize, and progress work differently.

Clinical Microbiology is patient-centric and organism-driven. Work develops over multiple days as specimens move through setup, incubation, observation, organism workup, susceptibility testing, and resulting. New findings can generate additional work, requiring laboratory staff to return to the same specimen repeatedly as its clinical state evolves.

Environmental Microbiology is more batch-oriented and operationally structured. Work is commonly organized around standardized processing, scheduled activities, repeatable methods, and operational throughput.

The existing product architecture did not adequately reflect these different workflow models. Clinical Microbiology activities were fragmented across multiple screens, follow-up work was frequently tracked outside the system, and laboratory staff repeatedly reconstructed specimen context while completing related work.

To ensure the proposed workflow reflected current laboratory practice, the Product team established an ongoing Client Advisory Group consisting of five client laboratory organizations. The group met regularly throughout the project, providing continuing feedback as workflow requirements, architecture, and design concepts evolved.

The advisory work formed part of the broader research and synthesis used to translate a cyclical, multi-day laboratory process into a task-based workflow and scalable information architecture.

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METHOD

The Product team partnered with five client laboratory organizations through an ongoing Client Advisory Group that met regularly throughout the project.

Sessions were used to:

1. Understand current Clinical and Environmental Microbiology workflows.
2. Identify recurring workflow challenges and operational constraints.
3. Examine how laboratory staff managed incubation, observations, and future work.
4. Compare patient-centric and batch-oriented workflow models.
5. Understand how users maintained specimen context across multiple days.
6. Examine the use of physical tools, reports, notes, and memory to manage pending work.
7. Validate assumptions about the existing task-based system architecture.
8. Review proposed workflow models and design concepts.
9. Gather feedback as requirements and designs evolved.

The Product team facilitated the sessions. As the UX Researcher and Workflow Designer, I attended the discussions, documented observations, identified recurring patterns across organizations, and synthesized the findings into themes that informed workflow modeling, information architecture, design principles, and subsequent validation.

The findings were reviewed collectively rather than treating each laboratory as an isolated case. This allowed the team to distinguish organization-specific practices from broader workflow patterns shared across laboratories.

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PARTICIPANTS

The Client Advisory Group consisted of five client laboratory organizations. The same organizations remained involved throughout the project, providing continuity as requirements evolved and design concepts matured.

Attendance varied by session. Each organization selected representatives based on the topics being discussed, participant availability, and the session's relevance to their responsibilities.

Participants represented a cross-functional range of laboratory roles, including:

1. Laboratory technician
2. Laboratory supervisors
3. Laboratory managers
4. Laboratory administrators
5. Pathologists
6. Other operational and subject-matter experts

Some participants spoke from direct experience performing daily laboratory work. Others contributed broader perspectives related to laboratory operations, workflow configuration, clinical oversight, organizational policy, or regional requirements.

Together, the participants provided both detailed operational knowledge and broader perspectives on how Microbiology workflows needed to be configured and managed.

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DISCUSSION TOPICS

The Client Advisory Group explored how Microbiology work progressed across specimen setup, incubation, observation, organism workup, and resulting. Topics evolved throughout the project as assumptions were validated and design concepts developed.

Discussion areas included:

1. Maintaining specimen context across multiple days
2. Managing incubation cycles and scheduled observations
3. Completing repeated and cyclical observations
4. Tracking pending reads and follow-up activities
5. Using racks, handwritten notes, reports, and memory cues
6. Navigating between screens and laboratory records
7. Understanding the current state of a specimen
8. Reviewing previous observations and completed work
9. Identifying what work needed to happen next
10. Relationships between specimens, media, organisms, tasks, and results
11. Clinical Microbiology's patient-centric and organism-driven workflow
12. Environmental Microbiology's batch-oriented and operational workflow
13. Regional differences in workflow timing and orchestration
14. Configurable workflow policies
15. Visibility into completed, current, pending, and future work
16. Review of proposed workflow models and design concepts

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KEY THEMES

THEME 1

WORKFLOW CONTINUITY IS FRAGMENTED

Clinical Microbiology work unfolds over multiple days and through repeated cycles of incubation, observation, organism workup, and follow-up. Participants described moving between several screens to complete related activities and repeatedly reconstructing specimen state when returning to the work.

The existing system treated activities as separate transactions rather than maintaining continuity across the full specimen lifecycle. Information entered during one activity was not always easy to locate during the next. Users therefore had to remember what had already occurred, determine the specimen's current state, and identify what should happen next.

This fragmentation was particularly difficult in Clinical Microbiology because workflow progression was not consistently linear. A new observation could generate additional testing, another incubation period, further organism workup, or a later review.

SUPPORTING EVIDENCE

1. Workflow context was distributed across multiple screens.
2. Users manually reconstructed specimen state while completing related work.
3. Users worked through cyclical observation loops rather than linear task sequences.
4. Incubation, observation, organism workup, and follow-up were not presented as one continuous workflow.
5. Users repeatedly moved between screens to complete a single observation.
6. Previous activities were not always visible within the context of the current task.
7. The system did not clearly communicate the specimen's overall progression.

"I'm going back and forth between screens just to finish one observation."
— Clinical Microbiology Laboratory Technician

IMPLICATIONS

1. Maintain workflow continuity across multiple days and incubation cycles.
2. Preserve specimen context as users move between related activities.
3. Support cyclical workflow progression rather than imposing a fixed linear sequence.
4. Present completed, current, and pending work as part of a continuous specimen history.
5. Make previous observations readily accessible during later work.
6. Reduce the need for users to reconstruct workflow state manually.
7. Provide a unified specimen timeline that shows how work has progressed.

THEME 2

FOLLOW-UP TRACKING HAPPENS OUTSIDE THE SYSTEM

Time-based follow-up was frequently managed through physical organization and user memory rather than through the product. Participants described using racks, handwritten notes, printed reports, and local conventions to remember which specimens required another observation or future action.

These external practices compensated for limited system visibility into workflow progression. Although follow-up work was clinically and operationally important, the system did not consistently identify when another read, observation, incubation step, or workup activity was due.

Physical location often became a representation of workflow state. Users understood what needed to happen next because a specimen had been placed on a particular rack or because a note or report remained visible in the laboratory.

SUPPORTING EVIDENCE

8. Time-based follow-up was managed primarily through physical organization.
9. Users relied on memory cues to remember future work.
10. Racks were used to represent workflow state and timing.
11. Handwritten notes and reports were used to manage pending activities.
12. The platform did not provide sufficient visibility into workflow progression over time.
13. Users returned to specimens because they remembered where the work had been placed.
14. Pending work could be overlooked when external tracking methods were interrupted or unavailable.
15. The system did not consistently generate or surface future work when specimen conditions changed.

“If it’s on this rack, I know I need to look at it again.”
— Clinical Microbiology Laboratory Manager

IMPLICATIONS

1. Manage time-based follow-up within the system.
2. Generate tasks from specimen state, workflow conditions, and elapsed time.
3. Surface scheduled reads and observations when they become due.
4. Reduce dependence on racks, handwritten notes, reports, and memory.
5. Clearly distinguish current work from future work.
6. Preserve an auditable record of follow-up activity.
7. Allow users to understand why a task was generated.
8. Support condition-driven tasks that respond to workflow progression.

THEME 3

SYSTEM ARCHITECTURE DOES NOT REFLECT REAL WORKFLOW MODELS

The advisory group confirmed that Clinical and Environmental Microbiology require different approaches to workflow orchestration.

Clinical Microbiology is patient-centric and organism-driven. Work evolves as observations are recorded and organisms are identified, with each finding potentially generating additional incubation, testing, interpretation, or follow-up. The workflow must preserve the relationship between the patient specimen, media, organisms, tasks, and results throughout this progression.

Environmental Microbiology is more batch-oriented and operationally structured. Work is commonly organized around repeatable processes, scheduled testing, standardized methods, and groups of samples moving through similar activities.

The existing task-based architecture did not adequately account for these differences. A single rigid workflow model could not accurately support both domains without either fragmenting Clinical Microbiology work or adding unnecessary complexity to Environmental workflows.

Participants also described regional and organizational differences in timing, review practices, and workflow policies. These differences required configurability rather than a single prescribed sequence.

SUPPORTING EVIDENCE

1. Clinical Microbiology workflows were patient-centric.
2. Clinical work was driven by specimen and organism progression.
3. New observations could generate additional testing and follow-up.
4. Environmental Microbiology workflows were batch-oriented.
5. Environmental work emphasized standardized and operational processing.
6. The existing architecture did not adequately support both workflow models.
7. Regional differences affected workflow orchestration and timing.
8. Organizational policies influenced when work was generated, reviewed, or completed.
9. Users required flexibility without losing overall workflow structure.

“I have to come back to this later—there’s nothing in the system that tells me when.”
— Clinical Microbiology Laboratory Technician

IMPLICATIONS

1. Support distinct orchestration models for Clinical and Environmental Microbiology.
2. Organize Clinical workflows around specimen and organism progression.
3. Preserve batch-oriented support for Environmental workflows.
4. Separate core workflow concepts from organization-specific configuration.
5. Allow timing, task-generation, and follow-up rules to be configured.
6. Avoid forcing fundamentally different workflows into one rigid system model.
7. Connect specimens, media, organisms, tasks, and results within a shared architecture.
8. Support both domains without duplicating the entire product experience.
9. Make domain-specific workflow behavior explicit within the system.

THEME 4

NAVIGATION AND WORKFLOW VISIBILITY ARE LIMITED

Participants described entering information as relatively straightforward but finding and reusing that information as difficult. Completing one observation or organism workup could require movement across multiple screens, while important workflow details were distributed across separate records and views.

The existing experience did not provide a unified representation of specimen progression. Users could not easily see previous observations, current work, pending reads, organism activity, or future tasks in one place.

As work continued over several days, this navigation burden increased. Each return to the specimen required users to relocate information and reconstruct the relationship between earlier observations and current activities.

SUPPORTING EVIDENCE

1. Users moved between multiple screens to complete a single observation or workup.
2. Key workflow information was distributed across separate records.
3. Information was easier to enter than to locate again.
4. No unified view showed specimen progression.
5. Pending reads and follow-up work were not visible in one location.
6. Users could not readily understand workflow state over time.
7. Previous observations were separated from current work.
8. Navigation increased the effort required to reconstruct specimen context.
9. Users lacked a consolidated view of completed, pending, and future activities.

“Entering the data is easy—it’s finding it again that’s the problem.”
— Senior Clinical Microbiology Laboratory Technician

IMPLICATIONS

1. Provide a unified view of specimen progression.
2. Consolidate observations, media, organisms, tasks, results, and follow-up activities.
3. Make prior entries easy to locate and reuse.
4. Show completed, current, pending, and future work within the same context.
5. Reduce navigation between disconnected screens.
6. Provide a longitudinal specimen timeline.
7. Preserve access to detailed records without losing the broader workflow context.
8. Make workflow state visible before users begin an activity.
9. Allow users to move between related entities without reconstructing their relationships.

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HOW THE RESEARCH INFLUENCED THE PROJECT

The Client Advisory Group showed that the central challenge was not limited to individual screens or isolated usability problems. The underlying system architecture did not reflect how Microbiology work progressed over time.

The findings established five principles for the future workflow:

WORKFLOW CONTINUITY: The system should represent Microbiology as a continuous workflow rather than a collection of disconnected activities. Users should be able to follow specimen progression across setup, incubation, observations, organism workup, and results.

STATE-BASED TASKS: Tasks should be generated by specimen state, workflow conditions, and timing. The product should surface follow-up work when it becomes relevant rather than requiring users to remember it independently.

CONTEXT PRESERVATION: Specimen, media, organism, task, and result information should remain connected throughout the workflow. Users should not need to reconstruct these relationships each time they return to the work.

DOMAIN AWARENESS: The system should recognize that Clinical and Environmental Microbiology use different workflow models. Shared product capabilities should support domain-specific orchestration rather than forcing both domains into one sequence.

CONFIGURABLE ORCHESTRATION: Workflow timing, follow-up rules, and operational policies should be configurable to support regional and organizational differences without changing the underlying architecture.

The research influenced:

1. Product requirements and user stories
2. Current-state workflow analysis
3. The cyclical Clinical Microbiology workflow model
4. The relationship between specimens, media, organisms, and tasks
5. The task-based information architecture
6. Condition-driven task generation
7. The unified specimen timeline
8. Workflow visibility and traceability
9. Domain-specific workflow orchestration
10. Configurable workflow policies
11. Design principles
12. Wireframes and prototype concepts
13. Usability-testing scenarios

The findings shifted the project from improving a collection of screens to redesigning how the product represented and coordinated the end-to-end Microbiology workflow.

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HOW THIS INFORMED THE NEXT PHASE

The Client Advisory Group established the recurring problems, workflow differences, and architectural constraints that required deeper investigation.

The next phase used current-state workflow interviews to examine how individual laboratories performed the work in greater detail. These interviews documented the activities, decisions, dependencies, external tracking methods, and handoffs involved in specimen setup, incubation, observation, organism workup, susceptibility testing, and resulting.

The advisory findings also established the areas that required further exploration:

1. Conduct deeper interviews with Clinical and Environmental users.
2. Document current-state workflows in greater detail.
3. Prototype future-state workflow concepts.
4. Validate a task-based workflow model.
5. Test condition-driven task generation.
6. Evaluate a unified specimen timeline.
7. Confirm that the architecture could support both Clinical and Environmental workflows.
8. Validate configurable timing and workflow policies.