**Final Comment – TDA-16: MonitorBot & Freshness Policy Engine**

**Summary**  
We implemented **MonitorBot**, a new backend worker responsible for maintaining long-term data freshness across the locations table.  
It automatically selects records whose next\_check\_at timestamp has expired (based on the defined Freshness Policy) and enqueues **VERIFICATION** tasks to trigger re-validation by the VerificationBot.  
This ensures that no business record remains stale for more than 90 days — effectively the *heartbeat* of the application’s data layer.

**Scope & Deliverables**

* New file: Backend/app/workers/monitor\_bot.py  
  → Async implementation using **SQLAlchemy**, **Pydantic v2**, and the existing async\_engine from services/db\_service.
* **Freshness Policy** implemented according to the Master Plan:
  + Confidence- and review-based intervals (3 → 90 days).
  + Special handling for *Temporarily Closed* and *Probable Not Open Yet* businesses.
  + Hard upper limit: 90 days.
* **Bootstrap phase:** fills missing next\_check\_at for all active records.
* **Due-check phase:** creates VERIFICATION tasks and bumps next\_check\_at forward.
* **Terminal states** (RETIRED, SUSPENDED) are now fully excluded from monitoring.

**Results**

* Initial dry-run and production runs completed successfully:
* initialized next\_check\_at for 1244 records
* enqueued=0 bumped\_next\_check\_at=0
* records >90d overdue (after run): 0
* Historical terminal records with obsolete next\_check\_at were cleaned up:
* UPDATE locations
* SET next\_check\_at = NULL
* WHERE state IN ('RETIRED','SUSPENDED');

→ Post-check confirmed **0 active records without next\_check\_at** and **0 terminal records with next\_check\_at**. ✅

**Acceptance Criteria**

* ✅ next\_check\_at correctly calculated based on confidence / status / reviews.
* ✅ Records processed in configurable batches (MONITOR\_MAX\_PER\_RUN=200).
* ✅ No record older than 90 days remains after a run.
* ✅ Business-status changes re-verified via new VERIFICATION tasks.

**Definition of Done**

* MonitorBot fully operational and idempotent.
* Freshness Policy logic functional and capped at 90 days.
* Automatic re-verification pipeline integrated with tasks queue.
* Data quality preserved over time; terminal states excluded from rotation.