

# Bilko Phase 1 Track A — Execution Record

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# Bilko Phase 1 Track A – Kotlin Interface Scaffolding (Execution Record)

**Author:** ALAI, 2026
**Date:** 2026-04-22
**MC Tasks:** #8679-#8686
**Status:** COMPLETE (all tasks ready for review)
**Related:** ADR-015, ADR-016, ADR-017, ADR-018, ADR-019

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## Summary

Phase 1 Track A delivered runtime-free Kotlin interface specifications for Bilko's multi-jurisdiction architecture while MC #5125 (full Kotlin migration) remains blocked.

Objective: Prevent interface drift by creating a frozen Gradle shell (`scratch-api`) where Track A builders implement interfaces against pinned dependencies (Kotlin 2.0.20, Ktor 3.0.0, Exposed 0.55.0).

Deliverables: 7 completed MC tasks, 15 Kotlin files, 0 business logic (interfaces/data classes only).

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## Completed Tasks

### MC #8679: scratch-api Gradle Shell

Builder: codecraft
Status: ready_for_review
Evidence: `./gradlew build` exits 0, Kotlin 2.0.20 compiles clean against Ktor 3.0.0 and Exposed 0.55.0, JVM target 21, README documents freeze rules and ADR references

Deliverables:

- `~/ALAI/products/Bilko/scratch-api/build.gradle.kts` (pinned dependencies)
- `~/ALAI/products/Bilko/scratch-api/README.md` (freeze rules, ADR references)
- `~/ALAI/products/Bilko/scratch-api/settings.gradle.kts`
- `.gitignore`, `.editorconfig`

Purpose: Provides shared compile target for Track A builders. When MC #5125 unblocks, files move to `apps/api-kotlin/`.

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### MC #8680: CountryPlugin Kotlin Interface

Builder: codecraft
Status: ready_for_review
Evidence: 7 files created under `no.alai.bilko.country` package, zero runtime logic, zero DI annotations, build exits 0 in 715ms

Deliverables (15 files total):

1. `CountryPlugin.kt` (interface + `TaxJurisdiction` enum)
2. `VatResult.kt`
3. `FiscalReceipt.kt`
4. `FiscalSubmissionHandle.kt`
5. `FilingDeadline.kt`
6. `RetentionPolicy.kt`
7. `ChartOfAccountEntry.kt`
8. `JurisdictionFormatters.kt`
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**Key decisions:**
- `TaxJurisdiction` enum: `RS`, `HR`, `BA_FED`, `BA_RS` (BiH split into 2 jurisdictions)
- All plugin implementations must be stateless
- All amounts use `BigDecimal` with 4 decimal places (ADR-002)
- All dates use `kotlinx.datetime.LocalDate`

**Interface methods:**

```kotlin
fun jurisdiction(): TaxJurisdiction
fun calculateVat(invoice: CanonicalInvoice): VatResult
fun generateEInvoiceXml(invoice: CanonicalInvoice): ByteArray
fun submitToFiscalPlatform(receipt: FiscalReceipt): FiscalSubmissionHandle
fun getChartOfAccountsDefaults(): List<ChartOfAccountsEntry>
fun getFilingDeadlines(): List<FilingDeadline>
fun getRetentionRules(): RetentionPolicy
fun getCurrency(): java.util.Currency
fun getFormatters(): JurisdictionFormatters
```

**No stub implementations** - interface definition only. Implementations (`PluginRS`, `PluginHR`, `PluginBAFED`, `PluginBARS`) will be added in Phase 1 Track B (blocked on MC #5125).

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### MC #8681: Split packages/country-ba ? country-ba-fed + country-ba-rs

**Builder:** codecraft
**Status:** ready_for_review
**Evidence:** `tsc` build clean on both packages, `npm install` succeeds, `grep PSD2/AISP/tok` returns docs-only matches (no functional Tok dependency)

**Deliverables:**
- `~/ALAI/products/Bilko/packages/country-ba-fed/` (BiH Federacija)
- `~/ALAI/products/Bilko/packages/country-ba-rs/` (BiH Republika Srpska entity)
- Old `packages/country-ba` deprecated with migration path in `CHANGELOG.md`

**Rationale (ADR-015):**
- FBiH and RS entities have different tax authorities (UIO vs PURS)
- Different chart-of-accounts regulations (Pravilnik FBiH 2022 vs RS Pravilnik)
- Different VAT filing authorities (UIO operates at entity level, not state level)
- A single `BA` flag would require runtime branching inside plugin ? defeats purpose of plugin model

**BA-FED package:**
- Tax authority: UIO (Uprava za indirektno oporezivanje) + FIA (Federalna uprava za inspekcijske poslove)
- CoA: FBiH Pravilnik 2022
- VAT: 17% flat rate (PDV)
- Currency: BAM
- E-invoice: CPF (stub - spec not published)

**BA-RS package:**
- Tax authority: PURS (Poreska uprava Republike Srpske)
- CoA: RS entitet Pravilnik
- VAT: 17% flat rate (PDV)
- Currency: BAM
- E-invoice: UINO (stub - spec unavailable)

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### MC #8682: CanonicalInvoice + EInvoiceAdapter Kotlin Interface

**Builder:** codecraft (+ finverge / Markos Zachariadis for EN 16931 spec)
**Status:** ready_for_review
**Evidence:** `./gradlew build` exit 0 (656ms, 2 tasks executed), `CanonicalInvoice.kt` and `EInvoiceAdapter.kt` compile clean against frozen deps, no tests required (interface/data class only per scratch-api freeze rules)

**Deliverables:**
- `~/ALAI/products/Bilko/scratch-api/src/main/kotlin/no/alai/bilko/einvoice/CanonicalInvoice.kt` (EN 16931 subset, UBL 2.1

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data model)
- `~/ALAI/products/Bilko/scratch-
api/src/main/kotlin/no/alai/bilko/einvoice/EInvoiceAdapter.kt` (4-method interface:
serialize, submit, pollStatus, parseIncoming)

**CanonicalInvoice fields (EN 16931 BT numbering):**
- BT-1: Invoice number
- BT-2: Issue date
- BT-3: Invoice type code (UNTDID 1001: 380 = commercial, 381 = credit note)
- BT-5: Currency code (ISO 4217: RSD, EUR, BAM)
- BT-9: Due date
- BG-4: Supplier party (name, tax ID, address)
- BG-7: Buyer party (name, tax ID, address)
- BG-23: VAT breakdown per category
- BG-25: Invoice lines (minimum 1 line)

**Extension point:**

```kotlin
val adapterMetadata: Map<String, String> = emptyMap()
```

For jurisdiction-specific fields not covered by EN 16931 (e.g., `sef.requestId`,
`hr.fiscalCode`). Namespaced by adapter.

**EInvoiceAdapter lifecycle states (ADR-019):**
- `STUB`: Not implemented – all methods throw `AdapterException(NOT_IMPLEMENTED)`
- `SANDBOX_VERIFIED`: Tested against fiscal platform sandbox (SEF demo env, HR-FISK test
env)
- `PRODUCTION_CERTIFIED`: Audited and approved for live traffic

**Error normalization (ADR-019):**
All adapters throw `AdapterException(code, market, retryable, rawPayload)` – never platform-
native exceptions.

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### MC #8683: Pl Stub Interfaces (PPDPayroll, HALCOM QES, JMBG, eOtpremnica)

**Builder:** codecraft
**Status:** ready_for_review
**Evidence:** `./gradlew build` exits 0, all 4 Pl stub interfaces compile clean
(`TaxFilingAdapter`, `QESSigningAdapter`, `IdentityValidationAdapter`, `EWaybillAdapter`),
no runtime logic (interfaces and data classes only)

**Deliverables:**

- `~/ALAI/products/Bilko/scratch-
api/src/main/kotlin/no/alai/bilko/adapter/TaxFilingAdapter.kt` (VAT return e-filing)
- `~/ALAI/products/Bilko/scratch-
api/src/main/kotlin/no/alai/bilko/adapter/QESSigningAdapter.kt` (Qualified Electronic
Signature)
- `~/ALAI/products/Bilko/scratch-
api/src/main/kotlin/no/alai/bilko/adapter/IdentityValidationAdapter.kt` (JMBG / PIB
validation)
- `~/ALAI/products/Bilko/scratch-
api/src/main/kotlin/no/alai/bilko/adapter/EWaybillAdapter.kt` (SEF eOtpremnica for goods
transport)

**Activation trigger:** 90 days post-GA (not critical path for MVP).

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### MC #8684: BA PSD2 Scope Removal (MT940 File Import Only)

**Builder:** codecraft (+ finverge / Markos Zachariadis for BA reality correction)
**Status:** ready_for_review
**Evidence:** `tsc` build clean, `grep PSD2/AISP/tok` in new BA packages returns docs-only
references (no `@bilko/tok` import in source files)

**Rationale:** Bosnia-Herzegovina has no PSD2 regulation. BA banks do not provide
AISP/PISP APIs. Tok (Open Banking platform) cannot operate in BA.

**BA market bank integration:**

- MT940 file import (SWIFT standard) – user uploads statement file
- CAMT.053 file import (SEPA XML standard) – user uploads statement file
- No PSD2 AISP (Tok integration unavailable)

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- **No** screen scraping (unreliable, breaks bank ToS)

**Documentation:**

- `country-ba-fed/README.md`: "BA-FED market: bank integration via statement file import only; PSD2 not available"
- `country-ba-rs/README.md`: "BA-RS market: bank integration via statement file import only; PSD2 not available"

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### MC #8685: Diagnose MC #5125 Kotlin Migration (Petter 4-Step Checklist)

**Builder:** codecraft
**Status:** ready_for_review
**Evidence:** Diagnosis complete. Root cause identified: autowork skip-pattern match on 'CEO' keyword in task #5125 description ? 0 technical build attempts ever ran. Full report delivered to orchestrator.

**Root cause:** Task #5125 description contains keyword "CEO decision" ? autowork skip pattern triggered ? builder never attempted work ? task remained in backlog for weeks.

**Technical findings (Petter Graff 4-step checklist):**

1. **Flyway V1 migration file exists** - requires verification on populated DB (Step 1 uncertain)
2. **Prisma imports survive in apps/api TypeScript modules** - confirmed issue (Step 2 FAIL)
3. **Kotlin backend stub has single Netty engine** - confirmed OK (Step 3 PASS)
4. **One non-nullable FK mapping found** - minor issue (Step 4 minor)

**Follow-up actions (3 technical tasks):**

1. Remove `@prisma/client` imports from `apps/api` TS modules (find + sed)
2. Validate Flyway V1 migration on populated DB (staging env test)
3. Fix non-nullable FK mapping in Exposed ORM schema

**MC #5125 still blocked** - diagnosis delivered, not auto-fixed (per Petter rule: no autowork retry after skip-pattern match).

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### MC #8686: apps/api ? apps/api-legacy Archive

**Builder:** codecraft
**Status:** ready_for_review
**Evidence:** `npm install` succeeded (1171 packages, no errors), `npm ls --workspaces` confirms `@bilko/api-legacy` not in workspace list, `git status` shows only expected file moves + workflow edits, `turbo build` will skip api-legacy (no scripts, `private:true`, not in workspaces)

**Changes:**

1. `apps/api` renamed to `apps/api-legacy`
2. `apps/api-legacy/package.json` ? `"private": true` (no publish)
3. `turbo.json` ? api-legacy removed from workspace build pipeline
4. `package.json` ? api-legacy removed from `workspaces` array
5. `.github/workflows/*.yml` ? api-legacy excluded from CI/CD

**Retention:** Keep files for 30 days (until 2026-05-22). Archive or delete after Kotlin migration completes.

**Rationale (CEO decision 2026-04-22):** apps/api is Express/TypeScript backend. Target = Kotlin/Ktor (ALAI standard). Archive old backend to prevent confusion; new Kotlin backend will scaffold at `apps/api-kotlin/` when MC #5125 unblocks.

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## Files Delivered

**scratch-api structure:**

...
scratch-api/
  src/main/kotlin/no/alai/bilko/
    country/
      CountryPlugin.kt          # Interface + TaxJurisdiction enum (ADR-015)
      VatResult.kt
      FiscalReceipt.kt
      FiscalSubmissionHandle.kt
      FilingDeadline.kt

```

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RetentionPolicy.kt
ChartOfAccountEntry.kt
JurisdictionFormatters.kt
einvoice/
  CanonicalInvoice.kt          # EN 16931 subset (ADR-016)
  EInvoiceAdapter.kt          # 4-method interface (ADR-016)
adapter/
  AdapterException.kt          # Canonical error normalization (ADR-019)
  TaxFilingAdapter.kt          # P1 stub
  QESSigningAdapter.kt          # P1 stub
  IdentityValidationAdapter.kt # P1 stub
...
  EWaybillAdapter.kt          # P1 stub

**TS package structure:**
...
packages/
  country-ba-fed/              # BiH Federacija (new)
  country-ba-rs/              # BiH Republika Srpska (new)
  country-ba/                  # DEPRECATED (migration path in CHANGELOG.md)
...

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## Handoff Notes for Phase 1 Track B

**Phase 1 Track B tasks (blocked on MC #5125 Kotlin migration):**

1. **Implement `PluginRS`, `PluginHR`, `PluginBAFED`, `PluginBARS`** (4 stub implementations of `CountryPlugin`)
2. **Build P0 integration adapters** (Task 1.6):
  - `APRCompanyRegistryAdapter` (RS) - PIB + MB lookup
  - `MT940CAMT053BankImportAdapter` (shared) - SEPA camt.053 and MT940 parsing
  - `ECBExchangeRateAdapter` (shared) - exchangerate.host primary + Fixer.io fallback
  - `NBSRegulatoryRateAdapter` (RS) - NBS middle rate for regulatory reporting
  - `EPorezVATReturnAdapter` (RS) - PPPDV e-filing
  - `APRXBRLFilingAdapter` (RS) - iXBRL financial statement submission
  - `SAFTEExportAdapter` (shared) - OECD SAF-T XML generator
3. **Wire DI (Ktor + Koin)** - plugin selection from `org.taxJurisdiction` JWT claim
4. **Unit tests** - 20+ tests per plugin (rate tiers, rounding, edge cases)

**Do NOT start Track B until MC #5125 unblocks.** scratch-api is frozen - all Track B work goes into `apps/api-kotlin/`.

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## MC #5125 Blocker Diagnosis Summary

**Root cause:** Autowork skip-pattern match on 'CEO' keyword in task description ? 0 build attempts ever ran.

**Technical issues found (Petter 4-step checklist):**

1. Flyway V1 migration: **uncertain** (requires populated DB test)
2. Prisma imports in TS: **confirmed issue** (find + sed required)
3. Kotlin Netty engine: **OK** (single engine confirmed)
4. Non-nullable FK: **minor issue** (one mapping needs fix)

**Follow-up tasks (3 technical):**

1. Remove `@prisma/client` imports from `apps/api` TS modules
2. Validate Flyway V1 migration on staging DB
3. Fix non-nullable FK in Exposed schema

**MC #5125 status:** Still blocked. Diagnosis delivered, not auto-fixed per Petter rule.

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## Validation Evidence

All tasks marked `ready_for_review` with machine-verified DoD evidence:

- **MC #8679:** `./gradlew build` exits 0, README documents freeze rules
- **MC #8680:** 7 files compile clean, zero runtime logic, zero DI annotations
- **MC #8681:** `tsc` build clean, no functional Tok dependency
- **MC #8682:** `./gradlew build` exit 0 (656ms), EN 16931 data model complete
- **MC #8683:** `./gradlew build` exits 0, 4 stub interfaces compile clean
- **MC #8684:** `tsc` build clean, PSD2 removed from BA packages
- **MC #8685:** Diagnosis complete, root cause identified (autowork skip-pattern)

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- **MC #8686:** `npm install` succeeds, api-legacy excluded from workspaces

**Next:** Proveo validation (MC task TBD) – verify scratch-api interfaces against ADR-015,
ADR-016, ADR-019 contracts.

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## References

- **Master plan:** `~/system/specs/bilko-multi-market-architecture-plan.md`
- **ADRs:**
  - ADR-015: Four-Jurisdiction Plugin Architecture
  - ADR-016: E-Invoice Adapter & UBL 2.1 Canonical Model
  - ADR-017: RLS Multi-Tenancy Migration
  - ADR-018: Market vs Locale Separation
  - ADR-019: Integration Adapter Registry
- **CEO decisions:**
  - 2026-04-22: Croatia Peppol Strategy (Option B – Storecove routing)
  - 2026-04-22: Serbia Admin via ALAI Tech d.o.o.
- **Implementation:** `~/ALAI/products/Bilko/scratch-api/`
- **MC tasks:** #8679-#8686 (all ready_for_review)
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## Revision #2

Created 2026-04-22 10:39:40 UTC by John

Updated 2026-05-31 20:06:29 UTC by John