

Bilko Modul B-1 — GL Foundation Build (2026-06-13)

TL;DR

Bilko Modul B-1 GL Foundation je **KOMPLETAN**. Backend (commit 6efb16f9) + frontend (commiti 69c87cf3 + b1f6401a) izgradeni. GL subsystem je iza `BILKO_ACCOUNTING_GL` + `GL_AUTO_POST` flagova — obje default **OFF** globalno. Modul A (fakturisanje) potpuno netaknut. Proveo UAT **PASS 20/20** (MC #103549), Vlado domain acceptance **PRIHVACENO 19/19**, Petter (lead) sign-off: **merge GO**. PR #369 ceka CEO merge odluku — dormantan, flag-gated, nema regresije.

B-1 ZAVRSEN (stanje 2026-06-13)

Bilko Modul B-1 — GL Foundation je KOMPLETAN. Backend + frontend izgradjeni, Proveo UAT PASS (20/20), Vlado domain acceptance PRIHVACENO (19/19), Petter (lead) sign-off: merge GO. PR #369 je spreman za CEO merge odluku — flag-gated (`BILKO_ACCOUNTING_GL` default OFF), Module A potpuno netaknut, nema regresije.

Sta modul radi (iza `BILKO_ACCOUNTING_GL` flag, default OFF)

Backend (commit 6efb16f9)

- GL engine: tabele `journal_entries`, `journal_postings`, `posting_rules`, `account_mapping`, `bilko_flags`
- PG trigeri: balance-invariant (P0001), immutability (P0002), idempotency (P0004) — okidaju uzivo na PG16
- 9 REST endpointa na `/api/v1/accounting/*`
- Flyway V85 — permissions seed (`accounting:view`, `accounting:post`, `accounting:manage`)
- PAYMENT/CREDIT_NOTE bridge (unit-tested; `GL_AUTO_POST` zasebni flag, default OFF)
- 68 GL unit + 10 HTTP integration testova — sve zeleno

Frontend (commiti 69c87cf3 + b1f6401a)

- 5 stranica pod `app/(dashboard)/accounting/`:
 - **kontni-plan** — tabela Konto | Naziv | Uloga, HR account names (RRiF konvencija)

- **temeljnice** — glavna knjiga, paginirani pregled DRAFT/POSTED/REVERSED sa filterima
- **temeljnica/[id]** — detalj: postings Duguje/Potrazuje, akcije Potvrdi (DRAFT→POSTED) i Storno
- **nova-temeljnica** — rucni unos s live balance-check ($\Sigma D = \Sigma C$ prikazano uzivo)
- **bruto-bilanca** — per-account totalDebit/totalCredit/saldo, grand totals, asOf filter; $\Sigma D = \Sigma C$ indikator
- Sidebar "Knjigovodstvo" nav sekcija (gating: accountant/admin/owner rola)
- 404-graceful gating — kada je flag OFF, stranice prikazuju "Ovaj modul nije dostupan" (ne crashaju)
- 5 lokalizacijskih lokala
- Playwright spec: `apps/e2e/tests/accounting-b1.spec.ts` (commitan, spreman za browser run kada je demo SSL dostupan)

Tok racunovodje

1. Otvori **Kontni plan** — pregled konta (logicalRole / accountCode / jurisdikcija, HR RRiF)
2. Faktura/placanje kreira DRAFT temeljnicu automatski (kada je GL_AUTO_POST ON) ili rucni unos
3. **Potvrđi** DRAFT → POSTED (trajna, nepromjenjiva knjizba)
4. POSTED entry se pojavljuje u **Glavnoj knjizi** (temeljnice pregled)
5. **Bruto bilanca** pokazuje $\Sigma D = \Sigma C$ — system-level invariant verificiran trigerom i API-jem
6. Storno = nova reversing POSTED entry (append-only, original nikad ne brises; cl. 11.3 ZoR)

Validacija

Sloj	Rezultat	Detalji
Proveo UAT MC #103549	PASS 20/20	Puni lifecycle (DRAFT→POSTED→storno) + gate testovi (flag OFF → 404) + permission negatives (viewer → 403, unbalanced → 400). Bruto bilanca $\Sigma D = \Sigma C$ rucno verificirano. Mesh: mesh-thr-proveo-103535-20260613T044650Z. Layer: integration + fe-build (browser odgodjeno — demo SSL nedostupan; spec commitan).
Vlado domain acceptance	PRIHVACENO 19/19	Ovlasteni racunovoda. Posting-rule templates (6 dogadjaja, JSONB kontrakt), kontni plan HR, PDV razlaganje po stopi, reversing-entry semantika, append-only nepromjenjivost.

Sloj	Rezultat	Detalji
Petter (lead) sign-off	B-1 COMPLETE, merge GO	Commit 6efb16f9 backend + 69c87cf3/b1f6401a frontend. 78 testova zeleno. Scope eksplicitno zatvoreno per B-1 DoD.

Iskrene ogranicenja / odgodeno na B-2

- **Live invoice → auto-DRAFT:** bridge unit-tested; e2e nije provjereno (GL_AUTO_POST je OFF zasebni flag; aktivira se u B-2 kada aktiviramo pilot org)
- **Browser-layer E2E:** odgodjeno (demo SSL nedostupan za Playwright live run); spec commitan u `apps/e2e/tests/accounting-b1.spec.ts`
- **Sekvencijalno numerisanje temeljnica:** B-2
- **Predujam (avans) bridge kompletno:** B-2 (6c knjizenje — netiranje avansa, djelomicni avans)

Production-activation gates (prije pravog racunovodje)

1. Operator ukljuci `BILKO_ACCOUNTING_GL = true` za imenovanog pilot org (`GL_AUTO_POST` ostaje OFF do gate 2)
2. **[VERIFY-NN] OBAVEZNO:** pravna provjera na narodne-novine.nn.hr / porezna-uprava.gov.hr za 10 VERIFY-NN stavki (PDV stope/clanci) — nije opcionalno
3. Imenovan racunovoda design-partner (board U2) live walkthrough sign-off

Status PR #369

Merge preporuka: **GO** — dormantan, flag-gated, Module A netaknut, nema regresije. Ceka CEO merge odluku.

Veze

- Spec/board page: [page 3115](#) (B-1 board presuda)
- PR #369 — `feature/b1-gl-foundation`
- MC #103531 (parent) | #103547 (backend Proveo) | #103548 (frontend Vizuz) | #103549 (UAT) | #103550 (docs)

Architecture

Database — 5 tables, Flyway migration V84

Table	Purpose	Key constraints
<code>bilko_flags</code>	Platform kill-switch flags (no Unleash dependency). <code>org_id IS NULL</code> = global default; non-null = per-org override.	Surrogate UUID PK + expression unique index <code>uq_bilko_flags(flag_name, COALESCE(org_id, '00..00'))</code> — required because Postgres 16 does not allow COALESCE in inline PRIMARY KEY/UNIQUE syntax.
<code>journal_entries</code>	GL header (one row per business event). Append-only per Article 11.3 ZoR.	UNIQUE(org_id, source_type, source_document_id) — idempotency invariant. Status enum: DRAFT / POSTED / REVERSED. RLS via V75 NULLIF fail-closed canonical pattern.
<code>journal_postings</code>	GL legs (debit/credit rows). Multiple rows per entry.	<code>amount > 0</code> , side IN ('DEBIT','CREDIT'). Immutability trigger fires if parent entry is POSTED/REVERSED.
<code>posting_rules</code>	Config-driven Vlado JSONB posting templates. Engine reads rules from here; never hardcodes account numbers.	Seeded with R-1 (taxable domestic) and R-3a (EU_41 exempt) on migration. Additional rules added without code changes.
<code>account_mapping</code>	Org-configurable logical-role-to-account-code mapping. Global HR defaults seeded (9 entries). Orgs can override per jurisdiction.	Expression unique index <code>uq_am_org_role(COALESCE(org_id,...), jurisdiction, logical_role)</code> — same PG16 fix pattern as bilko_flags.

Postgres Triggers — 3 enforcement points

Trigger	Function	What it enforces	Error code
<code>trg_je_balance_check</code>	<code>fn_je_balance_check</code>	Sum(DEBIT) == Sum(CREDIT) at the moment <code>status</code> transitions to POSTED. DRAFT entries are allowed to be unbalanced during assembly.	P0002 (balance violation) / P0003 (zero postings)
<code>trg_je_immutability</code>	<code>fn_je_immutability</code>	BEFORE UPDATE OR DELETE on <code>journal_entries</code> where OLD.status IN ('POSTED','REVERSED'). DRAFT rows remain mutable.	P0001

Trigger	Function	What it enforces	Error code
<code>trg_jp_immutability</code>	<code>fn_jp_immutability</code>	BEFORE UPDATE OR DELETE on <code>journal_postings</code> — checks parent entry status; fires if parent is POSTED/REVERSED.	P0004

PostingRuleEngine (Kotlin)

Located at `apps/api/src/main/kotlin/no/alai/bilko/gl/PostingRuleEngine.kt`. The engine is config-driven: it reads JSONB posting templates from the `posting_rules` table and resolves amounts from the incoming `GlDocumentData` struct. It never computes tax; all net/vat/gross values must originate from the Module A invoice document.

Key behaviours:

- **Gross check** — net + vat must equal gross; mismatch returns REJECTED status (no crash).
- **Rule lookup** — matched by (event_type, jurisdiction, vat_exemption_code). Most-specific match wins (rule with explicit vat_exemption_code scores higher than wildcard null match).
- **split_by vat_rate** — for multi-rate invoices (Event 2), one CREDIT posting is emitted per distinct VAT rate line, each carrying vat_rate for the B-2 VAT return.
- **No rule found** — returns ZA_KONTIRANJE status (no crash, Module A unaffected, accountant must manually post).
- **All drafts** — status=DRAFT, requiresAccountantConfirmation=true always set on output.

GlBridge — A to B integration point

Located at `apps/api/src/main/kotlin/no/alai/bilko/gl/GlBridge.kt`. Called from `InvoiceService.sendInvoice()` inside the existing `orgTransaction` after the invoice transitions to SENT status.

- If `BILKO_ACCOUNTING_GL=false`: early return, engine is never called (MockK verify exactly=0 confirmed by Proveo).
- If `GL_AUTO_POST=false`: early return.
- Both ON: engine called, result persisted as DRAFT via `GlRepository.persistDraft()`.
- Idempotent: if a journal entry already exists for the same (org, source_type, source_document_id), `persistDraft` returns null (no duplicate, no exception).
- Non-throwing: all GL errors are caught and logged; Module A (invoice flow) is never interrupted.

Posting Rules — Vlado's 6 Events

Domain contract authored by Vlado Brkanić (certified accountant, design-partner). Scope: outgoing/sales documents only, Croatian jurisdiction (HR). All amounts in EUR. Rates: 25% / 13% / 5% [VERIFY-NN čl.38].

Event	Description	Debit legs	Credit legs
1 — SALES_INVOICE_ISSUED (standard)	Taxable domestic invoice, VAT 25%, buyer Croatia. accounting_date = delivery/issue date.	1200 Kupci HR (gross)	7600 Prihodi HR (net), 2400 PDV obveza (vat)
2 — Multi-rate (13%+5%)	Same as Event 1 but VAT split across rates. Engine emits one CREDIT posting per rate, each carrying vat_rate.	1200 (gross)	7600 (net), 2400 @13% (vat slice), 2400 @5% (vat slice)
3a — EU exempt (čl.41)	B2B EU supply, zero VAT, report_target=ZP. Precondition: valid VIES VAT-ID.	1201 Kupci EU (gross)	7610 Prihodi EU (net) — no 2400
3b — Export exempt (čl.45)	Third-country export, zero VAT, not reported in ZP. Proof: customs export declaration.	1201 (gross)	7610 (net) — no 2400
3c — Exempt without deduction right (čl.39/40)	Zero VAT. vat_exemption_code preserved for B-2 pro-rata coefficient calculation.	1200/1201 (gross)	7600/7610 (net) — no 2400
4 — PAYMENT_RECEIVED	Cash inflow. Does not touch revenue or VAT accounts. Partial payment leaves receivable open.	1000 Žiro-račun (payment.amount); 1020 Blagajna for cash	1200 Kupci (closes receivable, closes_document_id set)
5 — CREDIT_NOTE	Reversal of Event 1. Reversing entry pattern — all legs inverted. source_type=CREDIT_NOTE, reverses_document_id set. No deletion of original.	7600 Prihodi (net), 2400 PDV (vat)	1200 Kupci (gross)

Event	Description	Debit legs	Credit legs
6 — Advance (3 steps)	<p>6a Advance received: D 1000 / C 2310 (net) + C 2410 (VAT on advance). VAT liability arises on receipt [VERIFY-NN čl.30/5].</p> <p>6b Final invoice on delivery: D 1200 / C 7600 + C 2400. Revenue recognised once.</p> <p>6c Netting: D 2310 + D 2410 / C 1200. Advance VAT reversed. Result: 2310/2410/1200 net to zero; no VAT doubling.</p>	See 6a/6b/6c	See 6a/6b/6c

JSONB Rule Format — R-1 and R-3a examples

R-1: Taxable domestic invoice (vat_exemption_code is null):

```
{
  "event_type": "SALES_INVOICE_ISSUED",
  "jurisdiction": "HR",
  "match": { "vat_exemption_code": null },
  "postings": [
    { "account": "1200", "side": "DEBIT", "amount_source": "invoice.gross", "analytic":
"partner:{invoice.partner_oib}" },
    { "account": "7600", "side": "CREDIT", "amount_source": "invoice.net" },
    { "account": "2400", "side": "CREDIT", "amount_source": "invoice.vat_by_rate", "split_by":
"vat_rate", "carry": ["vat_rate"] }
  ],
  "balance_assert": "sum(DEBIT) == sum(CREDIT)",
  "status_on_create": "DRAFT",
  "requires_accountant_confirmation": true
}
```

R-3a: EU-exempt supply (vat_exemption_code = "EU_41"):

```
{
  "event_type": "SALES_INVOICE_ISSUED",
  "jurisdiction": "HR",
  "match": { "vat_exemption_code": "EU_41" },
  "report_target": "ZP",
```

```

"postings": [
  { "account": "1201", "side": "DEBIT", "amount_source": "invoice.gross", "analytic":
"partner:{invoice.partner_vat_id}" },
  { "account": "7610", "side": "CREDIT", "amount_source": "invoice.net" }
],
"balance_assert": "sum(DEBIT) == sum(CREDIT)",
"status_on_create": "DRAFT",
"requires_accountant_confirmation": true,
"preconditions": ["partner_vat_id_valid_vies"]
}

```

How to Enable the Module (Operator Runbook)

The two flags

Flag	Default	Effect when ON
<code>BILKO_ACCOUNTING_GL</code>	false (global)	Enables the GL subsystem for the org. GIBridge checks this first. Without it, the engine is never called. Can be set per-org via <code>bilko_flags</code> (org_id non-null).
<code>GL_AUTO_POST</code>	false (global)	When both flags are ON, GIBridge calls the engine and persists a DRAFT journal entry on every invoice send. DRAFT entries appear in the accountant's queue for review and confirmation. The system never auto-transitions a DRAFT to POSTED.

What happens when both flags are ON

1. Invoice transitions to SENT in Module A (InvoiceService).
2. `GIBridge.onInvoiceIssued()` is called inside the existing `orgTransaction`.
3. `PostingRuleEngine` evaluates the invoice against JSONB rules in `posting_rules`.
4. A DRAFT journal entry + postings are persisted. `Status = DRAFT`, `requiresAccountantConfirmation = true`.
5. Accountant reviews the DRAFT in the (future) accounting module UI and transitions to POSTED manually.
6. If an entry already exists for this invoice (idempotency key), step 4 is a no-op.

[VERIFY-NN] legal-review gate

This gate must pass before auto-post can go live in production. Vlado's domain contract contains 10 [VERIFY-NN] annotations referencing Croatian tax law articles (ZoPDV, ZoR). The exact Narodne Novine references must be verified against porezna-uprava.gov.hr / narodne-novine.nn.hr before any POSTED auto-entries are generated for real clients. This is a platform-admin review gate — do not skip.

Validation Evidence

Proveo verdict: PASS — Angie Jones, 2026-06-13. Mesh thread: [mesh-thr-proveo-103535-20260613T044650Z](#). Validation report: [/tmp/evidence-103535/VALIDATION-REPORT-v2.md](#).

Two validation rounds were required:

- **v1 (PARTIAL)** — Commit 464c3d14: V84 migration blocked with SQLState 42601. Postgres 16 does not allow COALESCE expressions inside inline PRIMARY KEY / UNIQUE table constraint syntax. Affected 4 locations across bilko_flags and account_mapping.
- **v2 (PASS)** — Commit 687f1d0b (fix): Replaced inline COALESCE constraints with surrogate UUID PKs + separate expression unique indexes. All 4 locations corrected.

DB-invariant proofs (12 sub-tests on live Postgres 16)

Invariant	Probe	Expected	SQLState	Result
Balance trigger (reject)	POST entry with D=1000 / C=800, transition to POSTED	Exception: "balance violation"	P0002	PASS
Balance trigger (allow)	POST entry with D=1250 / C=1250, transition to POSTED	No exception	—	PASS
Idempotency	Insert duplicate (org_id, source_type, source_document_id)	Unique violation	23505	PASS
Entry immutability (UPDATE)	UPDATE POSTED journal_entry	Immutability violation	P0001	PASS
Entry immutability (DELETE)	DELETE POSTED journal_entry	Immutability violation	P0001	PASS
Posting immutability (UPDATE)	UPDATE posting row of POSTED entry	Immutability violation	P0004	PASS

Invariant	Probe	Expected	SQLState	Result
Posting immutability (DELETE)	DELETE posting row of POSTED entry	Immutability violation	P0004	PASS
DRAFT mutability	UPDATE on DRAFT journal_entry	No exception, persisted	—	PASS
+4 schema/flag proofs (tables present, indexes present, triggers present, flag seeds confirmed)				

Test counts

- **16 unit tests:** PostingRuleEngineTest (10/10) + GIBridgeTest (6/6) — MockK, no DB.
- **12 DB-invariant tests:** GInvariantDbTest — full Flyway V1-V84 on postgres:16-alpine Testcontainer.
- SelfPostingConstraintTest (2/2) — migration regression guard.
- Pre-existing 4 failures in CountryPlugin XML tests — same on main, unrelated to B-1.

Flag safety (GIBridgeTest 6/6)

- BILKO_ACCOUNTING_GL=false: engine never called (MockK verify exactly=0).
- GL_AUTO_POST=false: engine never called.
- Both ON + DRAFT: engine called x1, persistDraft called x1.
- Both ON + ZA_KONTIRANJE result: no persist, no crash.
- Engine exception: swallowed, Module A unaffected.

What Is NOT Done Yet (Deferred to next B-1 slice)

- **Frontend kontni-plan UI** — accountant-facing account plan management screen.
- **Glavna knjiga / bruto bilanca API endpoints** — general ledger summary and trial balance REST endpoints.
- **Accountant DRAFT → POSTED screen** — UI for accountant to review and confirm draft journal entries.
- **Remaining posting rule seeds** — Events 3b (EXPORT_45), 3c (EXEMPT_39/40), 4 (PAYMENT_RECEIVED), 5 (CREDIT_NOTE), 6a/6b/6c (advance/advance-settlement) are domain-specified but not yet seeded as active rules in posting_rules table.
- **Live end-to-end test** — full invoice send with both flags ON, confirming a real DRAFT entry lands in the DB. Recommended for B-2 gate (Proveo open item).
- **[VERIFY-NN] legal review** — porezna-uprava.gov.hr article verification gate before production auto-posting is enabled.

Cross-links

- Spec and board decision: [BookStack page 3115 — Bilko Modul B \(Knjigovodstvo\) — Spec + Board presuda](#)
 - PR #369: `feature/b1-gl-foundation` (not yet merged)
 - MC #103531 (parent build task)
 - MC #103535 (Proveo validation task)
 - Domain contract: `/tmp/evidence-knjigovodstvo/vlado-posting-rule-templates-B1.md`
 - Validation report v2: `/tmp/evidence-103535/VALIDATION-REPORT-v2.md`
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Revision #3

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