

Report 3: Multi Page Invoice Testing and Issues Found

Aliyan Faisal · a new set of invoices the extractor has never seen

These are multi-page invoices. Every invoice in this report runs to two, three or four pages, with repeated headings, carried-forward rows, section totals and other content that single-page invoices do not have. Lower accuracy is expected on invoices like these. The results below show where the extractor needs further improvement, and later reports score the same invoices again so that the effect can be seen.

1. Summary

Reports 1 and 2 measured single-page invoices. Report 2 ended with a caution: the extractor had been tuned on the same invoices it was scored on, so its score there was optimistic. This report scores the invoice checker on a fresh set that it has never seen. **The set is 40 invoices with 40 answer keys. Of these, 9 run to two pages, 21 to three and 10 to four, and 20 carry a planted mistake.** The extractor was not changed for this report.

Rules extractor (the real one)	Corpus A: single-page (Report 2)	Corpus C: multi-page (this report)
Field accuracy	98.1%	72.2%
Planted mistakes found	31 of 32	13 of 20
False alarms	6	50
Correct invoices with no findings	12 of 15	8 of 20
Oracle: mistakes found / false alarms	32 of 32 / 0	20 of 20 / 0

Result. The checking rules are correct: given perfect values (the oracle) they read all 2,521 line-item cells correctly, found all 20 planted mistakes and raised no false alarms, so every error below comes from reading the invoices. The rules extractor scored 72.2% field accuracy, lower than the 98.1% on corpus A. Longer and more complex invoices are harder to read. Two things explain most of the gap. First, all 10 Swiss-franc invoices score between 2% and 5%, because the extractor does not read the Swiss way of writing numbers (1'234.56). Second, the other 30 invoices score 94.6%, but descriptions that wrap onto a second line, item codes beside descriptions, and rows such as section totals, carried-forward and deposit lines cause wrong totals and 45 of the 50 false alarms.

2. The test invoices

The set was made with a separate multi-page generator, written after Reports 1 and 2 and independent of the extractor. Each invoice has 40 to 90 lines. The first page carries the supplier and customer details; the following pages repeat the supplier, the invoice number and the column headings, and the totals sit on the last page. Altogether the set holds 2,521 line items. All invoices are fictitious. Every invoice and its answer key can be opened from the Harness Reports page of this site, and the invoice numbers in section 4 are links to the PDFs.

Page structures (invoices): classic 6, coded 6, inline 10, stacked 7, wide 11. **Currencies** (invoices): CHF 10, EUR 10, CAD 7, AUD 7, SEK 6, including the Swiss number format. 10 visual designs, half of the invoices correct and half with one planted mistake.

Content that makes reading harder	What it looks like	Invoices
Wrapped description	A long description continues on a second line.	40
Reference block	A PO number, order and delivery dates and a customer reference near the invoice number.	37
Carried-forward rows	"Carried forward" at the foot of a page and "Brought forward" at the top of the next.	23

Content that makes reading harder	What it looks like	Invoices
Part-number note	A grey part number under a line.	21
Bank details	Bank name, account and payment details after the totals.	21
Section totals	Headings such as "Parts" and "Labour", each with its own total row.	19
Free line	A line priced at zero and marked "included".	19
Negative line	A credit shown as a negative line.	16
Deposit and balance due	"Less deposit paid" and "Balance due" printed after the invoice total.	12
Remittance slip	A tear-off slip repeating the invoice number and amount due.	12
Ship-to address	A delivery address that differs from the customer.	11

Tax Invoice

Invoice # 1001-1, Date: 2023-01-01, Due: 2023-01-15

Customer: MyCo Ltd

123 Main St, Suite 100

New York, NY 10001

Tel: 212-555-1234

Supplier: ABC Corp

456 Elm St, Suite 200

New York, NY 10002

Tel: 212-555-5678

Bill to: ABC Medical Products Inc

789 Pine St, Suite 300

New York, NY 10003

Tel: 212-555-9012

Payment Terms: Net 30

Payment Method: Bank Transfer

Product Details

Description	Qty	Unit	Amount
Part 1234	10	EA	100.00
Part 5678	5	EA	250.00
Part 9101	2	EA	400.00
Part 2345	1	EA	150.00
Part 6789	3	EA	300.00
Part 0123	1	EA	200.00
Part 4567	1	EA	100.00
Part 8901	1	EA	50.00
Part 3456	1	EA	75.00
Part 7890	1	EA	125.00
Part 1111	1	EA	175.00
Part 2222	1	EA	225.00
Part 3333	1	EA	275.00
Part 4444	1	EA	325.00
Part 5555	1	EA	375.00
Part 6666	1	EA	425.00
Part 7777	1	EA	475.00
Part 8888	1	EA	525.00
Part 9999	1	EA	575.00
Part 0000	1	EA	625.00
Part 1010	1	EA	675.00
Part 2020	1	EA	725.00
Part 3030	1	EA	775.00
Part 4040	1	EA	825.00
Part 5050	1	EA	875.00
Part 6060	1	EA	925.00
Part 7070	1	EA	975.00
Part 8080	1	EA	1025.00
Part 9090	1	EA	1075.00
Part 0101	1	EA	1125.00
Part 1212	1	EA	1175.00
Part 2323	1	EA	1225.00
Part 3434	1	EA	1275.00
Part 4545	1	EA	1325.00
Part 5656	1	EA	1375.00
Part 6767	1	EA	1425.00
Part 7878	1	EA	1475.00
Part 8989	1	EA	1525.00
Part 9090	1	EA	1575.00
Part 0101	1	EA	1625.00
Part 1212	1	EA	1675.00
Part 2323	1	EA	1725.00
Part 3434	1	EA	1775.00
Part 4545	1	EA	1825.00
Part 5656	1	EA	1875.00
Part 6767	1	EA	1925.00
Part 7878	1	EA	1975.00
Part 8989	1	EA	2025.00
Part 9090	1	EA	2075.00
Part 0101	1	EA	2125.00
Part 1212	1	EA	2175.00
Part 2323	1	EA	2225.00
Part 3434	1	EA	2275.00
Part 4545	1	EA	2325.00
Part 5656	1	EA	2375.00
Part 6767	1	EA	2425.00
Part 7878	1	EA	2475.00
Part 8989	1	EA	2525.00
Part 9090	1	EA	2575.00
Part 0101	1	EA	2625.00
Part 1212	1	EA	2675.00
Part 2323	1	EA	2725.00
Part 3434	1	EA	2775.00
Part 4545	1	EA	2825.00
Part 5656	1	EA	2875.00
Part 6767	1	EA	2925.00
Part 7878	1	EA	2975.00
Part 8989	1	EA	3025.00
Part 9090	1	EA	3075.00
Part 0101	1	EA	3125.00
Part 1212	1	EA	3175.00
Part 2323	1	EA	3225.00
Part 3434	1	EA	3275.00
Part 4545	1	EA	3325.00
Part 5656	1	EA	3375.00
Part 6767	1	EA	3425.00
Part 7878	1	EA	3475.00
Part 8989	1	EA	3525.00
Part 9090	1	EA	3575.00
Part 0101	1	EA	3625.00
Part 1212	1	EA	3675.00
Part 2323	1	EA	3725.00
Part 3434	1	EA	3775.00
Part 4545	1	EA	3825.00
Part 5656	1	EA	3875.00
Part 6767	1	EA	3925.00
Part 7878	1	EA	3975.00
Part 8989	1	EA	4025.00
Part 9090	1	EA	4075.00
Part 0101	1	EA	4125.00
Part 1212	1	EA	4175.00
Part 2323	1	EA	4225.00
Part 3434	1	EA	4275.00
Part 4545	1	EA	4325.00
Part 5656	1	EA	4375.00
Part 6767	1	EA	4425.00
Part 7878	1	EA	4475.00
Part 8989	1	EA	4525.00
Part 9090	1	EA	4575.00
Part 0101	1	EA	4625.00
Part 1212	1	EA	4675.00
Part 2323	1	EA	4725.00
Part 3434	1	EA	4775.00
Part 4545	1	EA	4825.00
Part 5656	1	EA	4875.00
Part 6767	1	EA	4925.00
Part 7878	1	EA	4975.00
Part 8989	1	EA	5025.00
Part 9090	1	EA	5075.00
Part 0101	1	EA	5125.00
Part 1212	1	EA	5175.00
Part 2323	1	EA	5225.00
Part 3434	1	EA	5275.00
Part 4545	1	EA	5325.00
Part 5656	1	EA	5375.00
Part 6767	1	EA	5425.00
Part 7878	1	EA	5475.00
Part 8989	1	EA	5525.00
Part 9090	1	EA	5575.00
Part 0101	1	EA	5625.00
Part 1212	1	EA	5675.00
Part 2323	1	EA	5725.00
Part 3434	1	EA	5775.00
Part 4545	1	EA	5825.00
Part 5656	1	EA	5875.00
Part 6767	1	EA	5925.00
Part 7878	1	EA	5975.00
Part 8989	1	EA	6025.00
Part 9090	1	EA	6075.00
Part 0101	1	EA	6125.00
Part 1212	1	EA	6175.00
Part 2323	1	EA	6225.00
Part 3434	1	EA	6275.00
Part 4545	1	EA	6325.00
Part 5656	1	EA	6375.00
Part 6767	1	EA	6425.00
Part 7878	1	EA	6475.00
Part 8989	1	EA	6525.00
Part 9090	1	EA	6575.00
Part 0101	1	EA	6625.00
Part 1212	1	EA	6675.00
Part 2323	1	EA	6725.00
Part 3434	1	EA	6775.00
Part 4545	1	EA	6825.00
Part 5656	1	EA	6875.00
Part 6767	1	EA	6925.00
Part 7878	1	EA	6975.00
Part 8989	1	EA	7025.00
Part 9090	1	EA	7075.00
Part 0101	1	EA	7125.00
Part 1212	1	EA	7175.00
Part 2323	1	EA	7225.00
Part 3434	1	EA	7275.00
Part 4545	1	EA	7325.00
Part 5656	1	EA	7375.00
Part 6767	1	EA	7425.00
Part 7878	1	EA	7475.00
Part 8989	1	EA	7525.00
Part 9090	1	EA	7575.00
Part 0101	1	EA	7625.00
Part 1212	1	EA	7675.00
Part 2323	1	EA	7725.00
Part 3434	1	EA	7775.00
Part 4545	1	EA	7825.00
Part 5656	1	EA	7875.00
Part 6767	1	EA	7925.00
Part 7878	1	EA	7975.00
Part 8989	1	EA	8025.00
Part 9090	1	EA	8075.00
Part 0101	1	EA	8125.00
Part 1212	1	EA	8175.00
Part 2323	1	EA	8225.00
Part 3434	1	EA	8275.00
Part 4545	1	EA	8325.00
Part 5656	1	EA	8375.00
Part 6767	1	EA	8425.00
Part 7878	1	EA	8475.00
Part 8989	1	EA	8525.00
Part 9090	1	EA	8575.00
Part 0101	1	EA	8625.00
Part 1212	1	EA	8675.00
Part 2323	1	EA	8725.00
Part 3434	1	EA	8775.00
Part 4545	1	EA	8825.00
Part 5656	1	EA	8875.00
Part 6767	1	EA	8925.00
Part 7878	1	EA	8975.00
Part 8989	1	EA	9025.00
Part 9090	1	EA	9075.00
Part 0101	1	EA	9125.00
Part 1212	1	EA	9175.00
Part 2323	1	EA	9225.00
Part 3434	1	EA	9275.00
Part 4545	1	EA	9325.00
Part 5656	1	EA	9375.00
Part 6767	1	EA	9425.00
Part 7878	1	EA	9475.00
Part 8989	1	EA	9525.00
Part 9090	1	EA	9575.00
Part 0101	1	EA	9625.00
Part 1212	1	EA	9675.00
Part 2323	1	EA	9725.00
Part 3434	1	EA	9775.00
Part 4545	1	EA	9825.00
Part 5656	1	EA	9875.00
Part 6767	1	EA	9925.00
Part 7878	1	EA	9975.00
Part 8989	1	EA	10025.00
Part 9090	1	EA	10075.00
Part 0101	1	EA	10125.00
Part 1212	1	EA	10175.00
Part 2323	1	EA	10225.00
Part 3434	1	EA	10275.00
Part 4545	1	EA	10325.00
Part 5656	1	EA	10375.00
Part 6767	1	EA	10425.00
Part 7878	1	EA	10475.00
Part 8989	1	EA	10525.00
Part 9090	1	EA	10575.00
Part 0101	1	EA	10625.00
Part 1212	1	EA	10675.00
Part 2323	1	EA	10725.00
Part 3434	1	EA	10775.00
Part 4545	1	EA	10825.00
Part 5656	1	EA	10875.00
Part 6767	1	EA	10925.00
Part 7878	1	EA	10975.00
Part 8989	1	EA	11025.00
Part 9090	1	EA	11075.00
Part 0101	1	EA	11125.00
Part 1212	1	EA	11175.00
Part 2323	1	EA	11225.00
Part 3434	1	EA	11275.00
Part 4545	1	EA	11325.00
Part 5656	1	EA	11375.00
Part 6767	1	EA	11425.00
Part 7878	1	EA	11475.00
Part 8989	1	EA	11525.00
Part 9090	1	EA	11575.00
Part 0101	1	EA	11625.00
Part 1212	1	EA	11675.00
Part 2323	1	EA	11725.00
Part 3434	1	EA	11775.00
Part 4545	1	EA	11825.00
Part 5656	1	EA	11875.00
Part 6767	1	EA	11925.00
Part 7878	1	EA	11975.00
Part 8989	1	EA	12025.00
Part 9090	1	EA	12075.00
Part 0101	1	EA	12125.00
Part 1212	1	EA	12175.00
Part 2323	1	EA	12225.00
Part 3434	1	EA	12275.00
Part 4545	1	EA	12325.00
Part 5656	1	EA	12375.00
Part 6767	1	EA	12425.00
Part 7878	1	EA	12475.00
Part 8989	1	EA	12525.00
Part 9090	1	EA	12575.00
Part 0101	1	EA	12625.00
Part 1212	1	EA	12675.00
Part 2323	1	EA	12725.00
Part 3434	1	EA	12775.00
Part 4545	1	EA	12825.00
Part 5656	1	EA	12875.00
Part 6767	1	EA	12925.00
Part 7878	1	EA	12975.00
Part 8989	1	EA	13025.00
Part 9090	1	EA	13075.00
Part 0101	1	EA	13125.00
Part 1212	1	EA	13175.00
Part 2323	1	EA	13225.00
Part 3434	1	EA	13275.00
Part 4545	1	EA	13325.00
Part 5656	1	EA	13375.00
Part 6767	1	EA	13425.00
Part 7878	1	EA	13475.00
Part 8989	1	EA	13525.00
Part 9090	1	EA	13575.00
Part 0101	1	EA	13625.00
Part 1212	1	EA	13675.00
Part 2323	1	EA	13725.00
Part 3434	1	EA	13775.00
Part 4545	1	EA	13825.00
Part 5656	1	EA	13875.00
Part 6767	1	EA	13925.00
Part 7878	1	EA	13975.00
Part 8989	1	EA	14025.00
Part 9090	1	EA	14075.00
Part 0101	1	EA	14125.00
Part 1212	1	EA	14175.00
Part 2323	1	EA	14225.00
Part 3434	1	EA	14275.00
Part 4545	1	EA	14325.00
Part 5656	1	EA	14375.00
Part 6767	1	EA	144

Currency	Invoices	Field accuracy
SEK	6	94.5%
CAD	7	95.5%
AUD	7	96.6%

Fields read right. Green is 95% or better, amber 90 to 95%, red below 90%:

Field read wrong or missing	Correct	Page structure	Accuracy
Total	9/40	coded	38.9%
Tax rate	13/40	stacked	52.6%
Tax amount	14/40	inline	79.6%
Customer name	19/40	wide	82.7%
Currency	20/40	classic	95.9%
Subtotal	20/40		
Shipping	23/40		
Line description	1510/2521		
Supplier name	29/40		
Tax ID	30/40		
Line unit price	1896/2521		
Line amount	1896/2521		
Line quantity	1915/2521		
Invoice number	33/40		
Issue date	33/40		
Due date	33/40		
Discount	33/40		

Planted mistake type	Planted	Found
grand total	5	4
line total	9	7
missing tax ID	1	0
subtotal	4	2
tax	1	0

All 5 planted mistakes on the Swiss invoices were missed, because their numbers were not read at all. On the other invoices 13 of 15 were found.

4. Result for each invoice

Found = planted mistakes the tool reported. Extra = reports that match no planted mistake (false alarms).

Invoice	Pages	Structure	Cur.	Planted mistakes	Found	Extra findings
invoice-001	3	inline	CHF	none (correct invoice)	-	-
invoice-002	4	stacked	CHF	none (correct invoice)	-	-
invoice-003	3	wide	CAD	none (correct invoice)	-	grand total, missing issue date, missing due date
invoice-004	3	inline	SEK	none (correct invoice)	-	-

Invoice	Pages	Structure	Cur.	Planted mistakes	Found	Extra findings
invoice-005	3	wide	SEK	none (correct invoice)	-	-
invoice-006	3	inline	EUR	none (correct invoice)	-	subtotal, tax, grand total
invoice-007	4	wide	SEK	none (correct invoice)	-	missing invoice number
invoice-008	3	coded	CHF	none (correct invoice)	-	-
invoice-009	3	stacked	CAD	none (correct invoice)	-	grand total, missing issue date, missing due date
invoice-010	2	stacked	AUD	none (correct invoice)	-	grand total
invoice-011	2	inline	CHF	subtotal	0/1	-
invoice-012	3	coded	CHF	line total (line 14)	0/1	-
invoice-013	3	inline	CAD	subtotal	0/1	grand total, missing issue date, missing due date
invoice-014	3	coded	EUR	line total (line 49)	1/1	grand total
invoice-015	3	inline	SEK	line total (line 58)	1/1	-
invoice-016	3	classic	SEK	line total (line 40)	1/1	-
invoice-017	4	coded	CHF	line total (line 46)	0/1	-
invoice-018	4	inline	CAD	grand total	1/1	missing issue date, missing due date
invoice-019	2	wide	CHF	grand total	0/1	-
invoice-020	4	wide	EUR	line total (line 73)	1/1	grand total
invoice-021	3	wide	CHF	none (correct invoice)	-	-
invoice-022	3	stacked	AUD	none (correct invoice)	-	subtotal, tax, grand total
invoice-023	3	wide	SEK	none (correct invoice)	-	-
invoice-024	3	classic	AUD	none (correct invoice)	-	-
invoice-025	2	inline	EUR	none (correct invoice)	-	grand total, missing invoice number
invoice-026	3	classic	AUD	none (correct invoice)	-	grand total
invoice-027	4	stacked	CHF	none (correct invoice)	-	subtotal, grand total
invoice-028	2	wide	AUD	none (correct invoice)	-	missing invoice number
invoice-029	2	stacked	EUR	none (correct invoice)	-	grand total
invoice-030	2	wide	EUR	none (correct invoice)	-	tax, grand total, missing invoice number
invoice-031	4	classic	CAD	subtotal	1/1	grand total, missing issue date, missing due date
invoice-032	4	inline	EUR	grand total	1/1	-
invoice-033	3	coded	EUR	line total (line 15)	1/1	subtotal, tax, grand total
invoice-034	3	wide	AUD	grand total	1/1	subtotal
invoice-035	2	stacked	CHF	tax	0/1	subtotal, grand total
invoice-036	3	inline	EUR	grand total	1/1	-
invoice-037	4	classic	AUD	line total (line 3)	1/1	subtotal, tax, grand total
invoice-038	4	classic	CAD	subtotal	1/1	grand total, missing issue date, missing due date
invoice-039	3	wide	CAD	missing tax ID	0/1	missing issue date, missing due date

Invoice	Pages	Structure	Cur.	Planted mistakes	Found	Extra findings
invoice-040	2	coded	EUR	line total (line 23)	1/1	grand total

8 of 20 correct invoices produced no findings; 13 of 20 planted mistakes were found.

5. Problems found

Each problem below was confirmed against the saved results. None has been fixed in this report.

Problem	Evidence (multi-page invoices)	Effect
Swiss number format not read (thousands separated by an apostrophe, as in 1'234.56)	All 10 Swiss-franc invoices score 2% to 5%; every line item and total is missing, and all 5 planted mistakes on them are missed.	The largest single cause of the low score: the other 30 invoices score 94.6%.
A description that wraps onto a second line is cut short	230 wrong descriptions on the classic, inline, stacked and wide layouts, for example "Project management incl. travel" read as "Project management incl."	Description wrong; amounts and quantities are right.
An item code in front of the description (coded layout)	166 wrong descriptions on the coded layout, for example "A018 Glass panel 24-pack" instead of "Glass panel 24-pack". The coded layout scores 85%, against 95% to 97% for the other layouts (Swiss invoices set aside).	The same cause as the first problem in Report 2, now seen on new invoices.
Section totals and carried-forward rows read as invoice totals	All 15 invoices with a wrong total, and all 12 with a spurious shipping amount, have section totals or carried-forward rows.	False "grand total" mismatches; shipping shown where there is none.
"Less deposit paid" read as a discount	All 6 invoices with a spurious discount have a deposit and balance due.	Subtotal and total no longer add up, so false mismatches are raised.
Currency decided from "\$"	All 14 Australian and Canadian dollar invoices are read as US dollars. The Report 2 fix works only when the invoice states its currency.	Currency wrong; no finding is raised by itself.
Supplier and customer swapped when the customer block is printed first (wide layout)	9 invoices, all of the wide layout.	Supplier and customer names wrong.
Customer name missing when it follows a label on one line ("Billed to: Name", inline layout)	8 invoices, all of the inline layout.	Customer name missing.
Dates written with the month name in US order not read ("June 14, 2026")	Issue date and due date missing on all 7 Canadian-dollar invoices.	False "missing issue date" and "missing due date" warnings.
Tax rate and subtotal not found where the totals rows carry no labels (inline layout)	Tax rate missing on 17 and subtotal on 10 of the 30 non-Swiss invoices, most often on the inline layout (7 and 6).	Missing tax rate or subtotal; tax mismatches raised in error.

Conclusion

Multi-page invoices are harder to read, which is why accuracy is lower, while the checking rules stay correct. The problems in section 5 show where the extractor needs further improvement.

The invoices are synthetic and few (40), so read the numbers as a comparison and a list of things to fix, not exact real-world accuracy. Multi-page invoices are harder than single-page ones and lower accuracy is expected; this report is the baseline for them. Field accuracy is the harness's weighted score (money fields count more than names) everywhere in this report. The Swiss number format affects a quarter of the set and lowers every overall figure, which is why the results are also shown without it. The invoices were written by the same person who built the tool, with a generator separate from the extractor. The rules-ocr and broken extractors were not run on this set, and the harness trusts whatever the extractor returns.

The invoices, their answer keys and the raw results for this report can be downloaded from the Harness Reports page of this site.