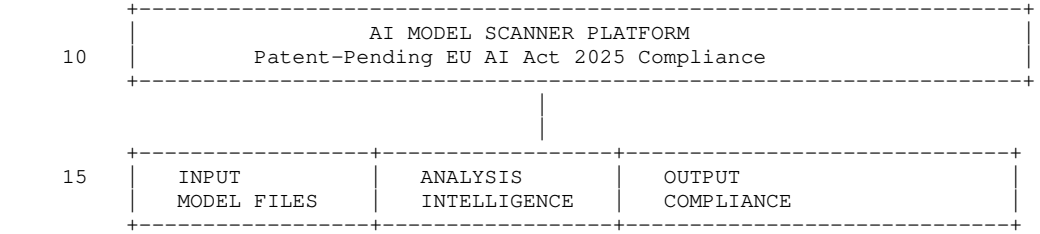
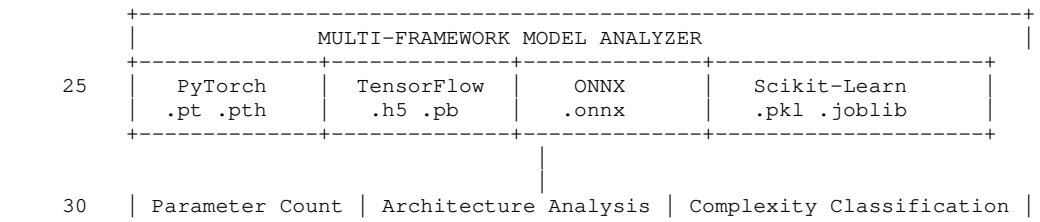
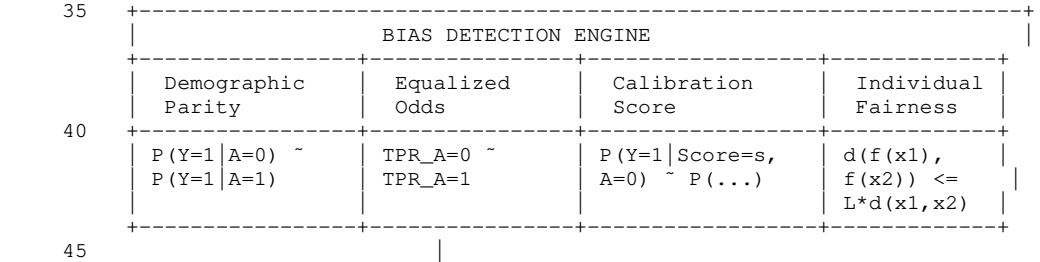
FIGUUR 1: SYSTEEM ARCHITECTUUR OVERZICHT



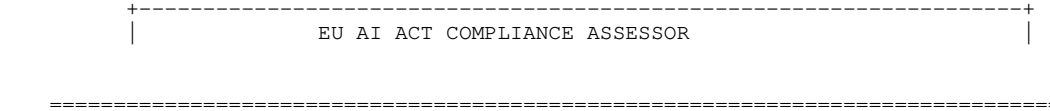
FIGUUR 2: MULTI-FRAMEWORK ANALYZER

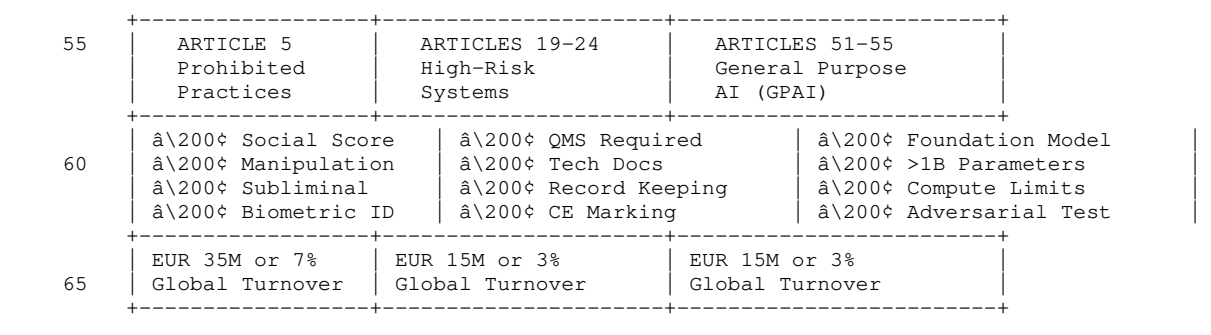


FIGUUR 3: BIAS DETECTION ENGINE

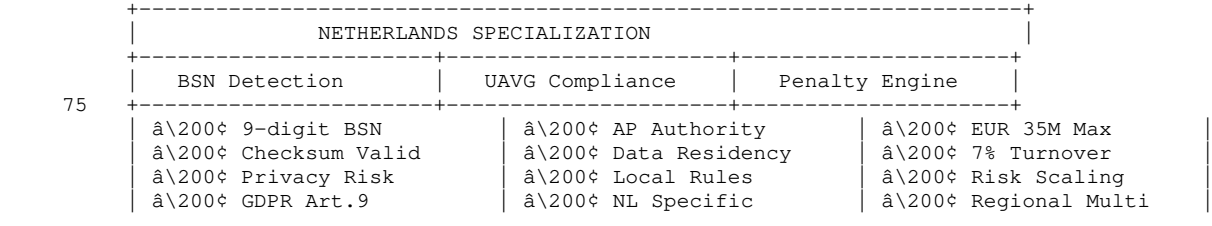


FIGUUR 4: EU AI ACT COMPLIANCE ASSESSOR





FIGUUR 5: NEDERLANDS SPECIALISATIE



```
+----------------------+----------------------+---------------------+
```

FIGUUR 6: MATHEMATISCHE FORMULES (GECORRIGEERD)

BIAS DETECTION ALGORITHMS:

Formule 1 - Demographic Parity:
$P(Y=1|A=0) \approx P(Y=1|A=1)$

Formule 2 - Equalized Odds:
$TPR_{A=0} \approx TPR_{A=1}$ EN $FPR_{A=0} \approx FPR_{A=1}$

Formule 3 - Calibration Score:
$P(Y=1|Score=s,A=0) \approx P(Y=1|Score=s,A=1)$

Formule 4 - Individual Fairness:
$d(f(x1),f(x2)) \leq L*d(x1,x2)$

BSN CHECKSUM VALIDATIE (GECORRIGEERD - Officieel Nederlands Algoritme):

```
checksum = (digit_0 x 9) + (digit_1 x 8) + (digit_2 x 7) +
           (digit_3 x 6) + (digit_4 x 5) + (digit_5 x 4) +
           (digit_6 x 3) + (digit_7 x 2) - (digit_8 x 1)
```


BSN is geldig als: checksum mod 11 == 0

Voorbeeld: BSN 111222333
= (1x9) + (1x8) + (1x7) + (2x6) + (2x5) + (2x4) + (3x3) + (3x2) - (3x1)
= 9 + 8 + 7 + 12 + 10 + 8 + 9 + 6 - 3
= 66 mod 11 = 0 Y GELDIG

PENALTY CALCULATION:

```
penalty = MAX(
            fixed_amount x regional_multiplier,
            revenue x percentage x regional_multiplier
          )
```

waarbij:
fixed_amount = EUR 35,000,000 (Artikel 5) of EUR 15,000,000 (Artikelen 19-24)
percentage = 7% (Artikel 5) of 3% (Artikelen 19-24)
regional_multiplier = Nederland-specifieke compliance factor

FIGUUR 7: SYSTEEM FLOW DIAGRAM

```
INPUT
  |
  +--> Multi-Framework Analysis
       |
       +--> Bias Detection
            |
            +--> EU AI Act Assessment
                 |
                 +--> Netherlands Specialization
                      |
                      +--> Real-time Monitoring
                           |
                           +--> Compliance Reports
```

FIGUUR 8: PROCESSING PIPELINE

```
+-------------------------------------------------------------------+
| STEP 1: Model Upload                                              |
|   â\200¢ Framework Detection (PyTorch/TensorFlow/ONNX/scikit-learn)   |
|   â\200¢ File Validation (.pt, .pth, .h5, .pb, .onnx, .pkl, .joblib)  |
+-------------------------------------------------------------------+
                                |
                                |
```



```
+-------------------------------------------------------------------+
| STEP 2: Architecture Analysis                                     |
```

```
|   â\200¢ Parameter Count (threshold: <1M, 1M-100M, 100M-1B, >1B)          |
|   â\200¢ Layer Configuration                                              |
|   â\200¢ Model Complexity Classification                                  |
+--------------------------------------------------------------------------+
                                  |
                                  |
+--------------------------------------------------------------------------+
| STEP 3: Bias Detection                                                   |
|   â\200¢ Demographic Parity (threshold: 0.80)                             |
|   â\200¢ Equalized Odds (TPR & FPR comparison)                            |
|   â\200¢ Calibration Score (per demographic group)                        |
|   â\200¢ Individual Fairness (Lipschitz continuity, L=1.0)                |
+--------------------------------------------------------------------------+
                                  |
                                  |
+--------------------------------------------------------------------------+
| STEP 4: EU AI Act Classification                                         |
|   â\200¢ Article 5 Check (Prohibited Practices)                           |
|   â\200¢ Articles 19-24 Validation (High-Risk Systems)                    |
|   â\200¢ Articles 51-55 Assessment (GPAI Models)                          |
|   â\200¢ Penalty Calculation (EUR 35M / EUR 15M)                          |
+--------------------------------------------------------------------------+
                                  |
                                  |
+--------------------------------------------------------------------------+
| STEP 5: Netherlands Compliance                                           |
|   â\200¢ BSN Detection (9-digit pattern + checksum)                       |
|   â\200¢ UAVG Validation (AP authority integration)                       |
|   â\200¢ Regional Penalty Multipliers                                     |
|   â\200¢ Dutch Language Support                                           |
+--------------------------------------------------------------------------+
                                  |
                                  |
+--------------------------------------------------------------------------+
| STEP 6: Report Generation                                                |
|   â\200¢ PDF/HTML Output                                                  |
|   â\200¢ Technical Documentation                                          |
|   â\200¢ Remediation Recommendations                                      |
|   â\200¢ Compliance Certificate (with AP stamp)                           |
+--------------------------------------------------------------------------+
```

FIGUUR 9: DEPLOYMENT ARCHITECTUUR

```
+--------------------------------------------------------------------------+
|                    DEPLOYMENT ARCHITECTURE                               |
```



```
|                                                                          |
|  +--------------+      +--------------+      +--------------+    |
|  |  Streamlit   |      |  PostgreSQL  |      |    Redis     |    |
|  |  Frontend    |â\227\204----â\226º|  Database    |â\227\204----â\226º|   Cache      |    |
|  +--------------+      +--------------+      +--------------+    |
|         |                                                                |
|         |                                                                |
|  +-------------------------------------------------------------+ |
|  |         AI Model Scanner Services                           | |
|  |  â\200¢ Multi-Framework Analyzer                              | |
|  |  â\200¢ Bias Detection Engine                                 | |
|  |  â\200¢ EU AI Act Compliance Assessor                         | |
|  |  â\200¢ Netherlands Specialization Module                     | |
|  +-------------------------------------------------------------+ |
|                                                                          |
|  Docker Container (Horizontale Schaalvergroting)                         |
+--------------------------------------------------------------------------+
```

FIGUUR 10: COMPETITIVE ADVANTAGE MATRIX

FEATURE	DataGuardian	OneTrust	TrustArc	IBM
Automated Bias	Y	N	N	W
Multi-Framework	Y	N	N	W
BSN Detection	Y	N	N	N
EU AI Act 2025	Y	W	W	W
Cost (Annual)	â\202¬2.5K-25K	â\202¬50K-500K	â\202¬75K-400K	â\202¬100K+
Cost Savings	BASELINE	95%	96%	97%

Legend: Y = Full Support, W = Partial Support, N = No Support

FIGUUR 11: VALUE PROPOSITION

```
+-------------------------------------------------------------------+
|              PATENT VALUE PROPOSITION                             |
+-------------------------------------------------------------------+
|                                                                   |
|  Market Opportunity:     â\202¬447M (EU-wide AI compliance market)  |
|  Target Market:          1.8M EU companies using AI               |
|  Netherlands Market:     â\202¬23M (150,000 companies)              |
|                                                                   |
|  Penalty Prevention:     Up to EUR 35M per violation              |
|  Cost Savings:           95% vs OneTrust/TrustArc                 |
|  Processing Speed:       <30s (vs hours manually)                 |
```



```
|  Accuracy:               95%+ bias, 98%+ compliance               |
|                                                                   |
|  First-Mover Advantage:  EU AI Act enforced Feb 2025              |
|  Patent Protection:      20 years (until 2045)                    |
|  Patent Value:           â\202¬1M - â\202¬2.5M                       |
|                                                                   |
+-------------------------------------------------------------------+
```

BELANGRIJKE TECHNISCHE CORRECTIES

BSN FORMULE CORRECTIE:

OUD (FOUT):
   checksum = SUM(digit_i x (9-i)) mod 11 N INCORRECT

NIEUW (CORRECT):
   checksum = (digit_0 x 9) + (digit_1 x 8) + ... - (digit_8 x 1) Y CORRECT

De laatste digit (digit_8) gebruikt factor 1, NIET factor (9-8)=1 via formule.
Dit is het officiÃ«le Nederlandse BSN 11-proef algoritme.

EINDE TEKENINGEN EN FORMULES