Subtitle: AI-Powered Cultural Risk Detection for International Business

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Track: Language Translation System

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BRINGING THE WORLD,

ONE CULTURE AT A TIME,

WITH AI's SHIELD

Miscommunication Shield Business Translator

The Problem:
$75B Lost Annually to Cultural Miscommunication

Real Business Disasters:

❌ KFC's "Finger-lickin' good" → "Eat your fingers off" (Chinese)

❌ Pepsi's "Come alive" → "Ancestors back from dead" (Taiwan)

Common Mistakes:

❌ "Hey! Send ASAP pls" → Unprofessional in French business

❌ "I'm embarrassed" → "I'm pregnant" in Spanish

Hindi Business Context:

❌ "Tu ye kaam kar" (You do this work) → Disrespectful to seniors

✅ Should be: "Aap ye kaam kar sakte hain?" (Could you do this work?)

Our Solution: Detect Cultural Risks BEFORE Sending

How It Works:

📝Input Message→🔍Risk Detection(Rule-based ML)→🤖Safe Translation(GPT4)

↓

✅ Warnings + Recommendations

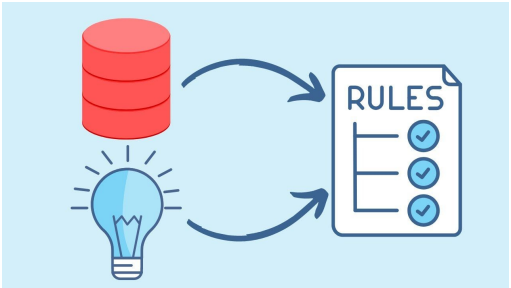
Key Features:

⚠️ Real-time risk scoring (Low/Medium/High)

🧠 Cultural pattern matching across 5 languages

📊 Explainable warnings with confidence scores

⚡ <1 second processing time



RULE-BASED LEARNING

System Architecture: Hybrid AI Design

Component 1: Risk Detection Module

- Pattern matching against cultural database
- Feature extraction (word counts, formality, commands)
- Scoring: (High_Risk × 3) + (Medium_Risk × 1.5)
- Output: Risk level + confidence

Component 2: Translation Module

- OpenAI GPT-4o-mini
- Prompt engineering with cultural context

Component 3: Recommendation Engine

- High Risk → ❌ DO NOT SEND
- Medium Risk → ⚠️ REVIEW
- Low Risk → ✅ SAFE

Dataset & Training: Expert-Curated Cultural Patterns

Data Strategy:

📚 100 synthetic examples with expert labels

🌍 5 languages: Japanese, French, Spanish, Hindi, Arabic

🎯 50+ risk patterns per language

Risk Distribution:

❌ High Risk: 35% (direct refusals, informal language)

⚠️ Medium Risk: 35% (urgency, abbreviations)

✅ Low Risk: 30% (polite, formal)

Impact: Prevents reputation damage before sending

Demo - High & Low Risk Detection

Input/Output	MESSAGE	Target	Context	RISK-DETECTOR
I/P	Tu ye urgent kaam abhi kar	Hindi	Email to senior client	-
O/P	"Tu" - Informal pronoun for senior	-	✅ SAFE: "Aap ye urgent kaam kar sakte hain?"	❌DO NOT SEND 🚨HIGH (85% confidence)
I/P	Aap ki help ke liye dhanyavad	Hindi	Thank You Email	-
O/P	✓ Formal and respectful	-	Translation: "Thank you for your help"	✅ SAFE TO SEND ✅ RISK: LOW (80% confidence)

Demo Snapshots

Results & Evaluation: 80% Accuracy on Cultural Risk Detection

Performance Metrics:

✅ Accuracy: 80% ✅ Precision: 100% (no false alarms) ✅ Speed: <1 second

Strengths:

✅ Excellent at explicit patterns (direct refusals, informal tone)

✅ Fast and explainable

Limitations:

- Pattern-based (can't detect new phrases)
- Needs API for translation
- 5 languages only

LLM Performance:

- Cultural adaptation successful
- Business tone preserved
- Consistent outputs (temp=0.3)
- Cost: ~$0.002 per message

Key Learnings & Future Work

Technical Skills:

- Prompt engineering for LLM consistency
- Hybrid AI (rules + neural networks)
- Feature engineering for explainability

Challenges Solved:

1. No dataset → Created synthetic with expert patterns
2. False positives → Three-tier risk system
3. LLM reliability → Temperature tuning

Biggest Learning: Simple features + cultural knowledge > Complex algorithms

Future Roadmap:

- Train on 10K+ real business communications
- Expand to 20+ languages with dialects
- Browser extension for Gmail/Slack
- Voice tone analysis for video calls

ONE WORLD, MANY VOICES,
AND A THOUSAND WAYS TO SAY
THANK YOU THROUGH THE
UNIVERSAL LANGUAGE OF THE.