

# Adaptive Multilingual Keyboard

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Concept by Emilio De Alba — 08 November 2025

## Problem

Bilingual and multilingual users constantly switch between keyboards and language settings when typing on smartphones. Current solutions require manual language changes or fail to handle mixed-language typing (e.g., English + German or Spanish + French). This interrupts workflow, slows down messaging, and leads to poor autocorrection accuracy.

## Solution

An intelligent keyboard that automatically detects the language being typed and adapts instantly — no manual switching required. The system analyzes input in real time and adjusts:

- Word predictions and autocorrect
- Grammar and spell-check
- Keyboard layout (e.g., accented characters, umlauts)
- Text direction and punctuation style

It supports true code-switching — changing languages mid-sentence without loss of accuracy.

## Core Features

- On-device language detection using lightweight multilingual ML models.
- Contextual adaptation every few words for fluid typing.
- Offline-first design with optional cloud optimization.
- Privacy-first approach — no text leaves the device unless the user opts in.
- Customizable behavior (auto-detect on/off, priority languages).

## Technical Overview

A compact model (e.g., DistilBERT / fastText hybrid) performs token-level language prediction. Each word's probability informs the keyboard's language context, instantly switching prediction dictionaries and layouts. The system learns from user habits locally and improves through federated learning — maintaining privacy while personalizing performance.

## **Privacy & Compliance**

- 100 % local processing by default.
- GDPR-compliant data handling.
- Transparent settings and easy data deletion.

## **Target Audience**

- Bilingual / multilingual smartphone users.
- International students and professionals.
- Travelers, expats, and global communication enthusiasts.

## **Market Potential**

Over 700 million multilingual users globally. Even 0.05 % adoption at €1 per user ≈ €350,000 revenue for a single feature/app. Potential integration with Android keyboard apps or OEM partnerships (Google Gboard, Microsoft SwiftKey, Samsung Keyboard).

## **Next Steps**

1. Prototype MVP using Android InputMethodService.
2. Train small multilingual detection models (fastText or DistilBERT).
3. Publish early alpha for testers.
4. Seek partnerships or funding for wider rollout.

## **Footer**

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