

Vociply: A Real-Time Voice-to-Voice Agentic System for Emerging Market Business Automation Using LLMs

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Problem Statement	System Architecture	Performance Results																						
<p>Emerging Market SME Barriers:</p> <ul style="list-style-type: none">Linguistic Diversity: Code-switching challenges systemsInfrastructure: Limited bandwidth, connectivity issuesCost Sensitivity: Restricted technology budgetsCultural Context: Lack of localized communication	<div><div><div>Audio Input</div><div>Speech Processing Core</div><div>Language Processing</div><div>Business Integration</div><div>Voice Response</div></div><div><div>Cultural Context Code-switching</div><div>Intent Recognition</div><div>AI Integration Function Calling</div><div>Tool Integration</div></div></div>	<table><tr><th>Primary Task</th><th>BlueMetric</th><th>Vociply</th><th>Baseline</th></tr><tr><td>Task Completion</td><td></td><td>87.1%</td><td>78.3%</td></tr><tr><td>Response Latency</td><td></td><td>1.9s</td><td>3.2s</td></tr><tr><td>Code-switching Accuracy</td><td></td><td>92.1%</td><td>65.4%</td></tr><tr><td>Network Resilience</td><td></td><td>85%+</td><td>60%</td></tr></table>			Primary Task	BlueMetric	Vociply	Baseline	Task Completion		87.1%	78.3%	Response Latency		1.9s	3.2s	Code-switching Accuracy		92.1%	65.4%	Network Resilience		85%+	60%
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Our Solution	Key Technical Features	Business Impact																						
<p>Vociply delivers:</p> <ul style="list-style-type: none">Real-time Voice-to-Voice: Sub-2-second latencyMultilingual Support: Code-switching capabilitiesBandwidth Optimized: Low-connectivity operationCultural Intelligence: Context-aware communicationBusiness Integration: AI-powered automation <p>Key Innovation First voice automation system for emerging markets, addressing linguistic and infrastructure challenges.</p> <p>Technical Innovations:</p> <ul style="list-style-type: none">Adaptive Code-switching: Dynamic language detectionLow-latency Processing: Variable network optimizationContext-aware Responses: Cultural domain understandingEdge Computing: Distributed processing reliability <p>Market Impact Economic Transformation:</p> <ul style="list-style-type: none">SME Empowerment: Democratizing AI accessJob Creation: Employment opportunitiesDigital Inclusion: Technology gap bridging <p>Operational Benefits:</p> <ul style="list-style-type: none">Reduced costs through automation24/7 customer service availabilityScalable business solutionsEnhanced customer satisfaction	<p>Sub-2-second latency across varying network conditions</p> <p>High accuracy in multilingual scenarios</p> <p>Adaptive quality control for different environments</p> <p>Cultural context integration</p> <p>Enterprise integration via standard APIs</p> <p>Language Processing Pipeline Our approach handles:</p> <ul style="list-style-type: none">Language Detection: Real-time multilingual identificationIntent Processing: Business context extractionResponse Generation: Culturally appropriate outputs <p>Performance Benchmarks Comprehensive Evaluation:</p> <ul style="list-style-type: none">Extensive Testing: Large-scale interaction evaluationMulti-scenario Analysis: Business case validationScalability Assessment: High-concurrency testingCross-cultural Validation: Regional adaptation <p>Implementation Details System Components:</p> <ul style="list-style-type: none">Speech Engine: Custom ASR/TTSNLP Pipeline: Intent recognitionBusiness Logic: Workflow automationIntegration Layer: RESTful APIs <p>Quality Assurance:</p> <ul style="list-style-type: none">Real-time monitoringContinuous model trainingEdge case fallbacksComprehensive analytics	<p>34% Cost Reduction</p> <p>28% Satisfaction Boost</p> <p>3.2x Call Capacity</p> <p>Real-World Deployment SME Deployments:</p> <ul style="list-style-type: none">Region 1: Retail, healthcare servicesRegion 2: Logistics, operationsRegion 3: Consulting, professional services <p>Evaluation Results:</p> <ul style="list-style-type: none">Cost reduction vs. traditional approachesCustomer satisfaction improvementContinuous availability achievedWorkforce transition to higher-value roles <p>Competitive Analysis Solution Advantages:</p> <ul style="list-style-type: none">vs. Global Platforms: Superior local language performancevs. Local Solutions: Enhanced response capabilitiesvs. Traditional: Significant operational efficiencyUnique Features: Native multilingual support																						
		Future Directions																						
		<ul style="list-style-type: none">Language Expansion: Additional regional supportAgent Marketplace: Industry-specific developmentOffline Capabilities: Hybrid operation modesEnhanced Intelligence: Sentiment analysisAnalytics Integration: Business intelligenceIoT Integration: Device connectivity																						
		Technical Advantages																						
		<ul style="list-style-type: none">Scalable Architecture: Cloud-native high concurrencyEdge Computing: Distributed processingSecurity Framework: Encryption and compliancePlatform Integration: Standard API connectivity																						
		Research Contributions																						
		<p>Novel Methodologies:</p> <ul style="list-style-type: none">Adaptive Models: Multilingual processingContext Engine: Communication patternsNetwork Optimization: Connectivity adaptationEvaluation Framework: Market benchmarking																						
		Strategic Partnerships																						
		<p>Industry Collaborations:</p> <ul style="list-style-type: none">Telecom Partners: Network optimizationFinancial Services: Payment integrationsGovernment: Technology developmentAcademic: Research collaborations																						

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Ethical AI Deployment: This research prioritizes responsible AI implementation with consideration for labor impact, data privacy, and cultural sensitivity.