

The Interface Shift

From 'Apps' to 'Autonomous Agents' in Travel & Expense

● AI/ML Technical Documentation ● Production Systems ● Fintech Innovation ●

Technical Documentation Series

December 2024

Executive Summary

Corporate Travel & Expense is shifting from self-service booking tools to autonomous agents that negotiate, book, and fix travel without user intervention. Navan and Brex are pioneering agentic AI that acts as corporate concierge, not just booking interface.

Zero Touch Booking Goal	99%+ Document Accuracy	<50ms Policy Check
Navan Cognition AI Framework	Brex Composer Expense Agent	Voice Agent Hotel Calls

The Death of the Booking Tool



For 20 years, Online Booking Tools (OBTs) like Concur digitized travel agencies but shifted booking labor to employees. The paradigm is reversing: from self-service to agentic service where AI does the work.

• The App Era vs Agent Era

- **App Era:** Better tools for users to do work themselves
- **Agent Era:** AI does the work for users autonomously
- **Self-Service → Agentic Service:** Fundamental paradigm shift

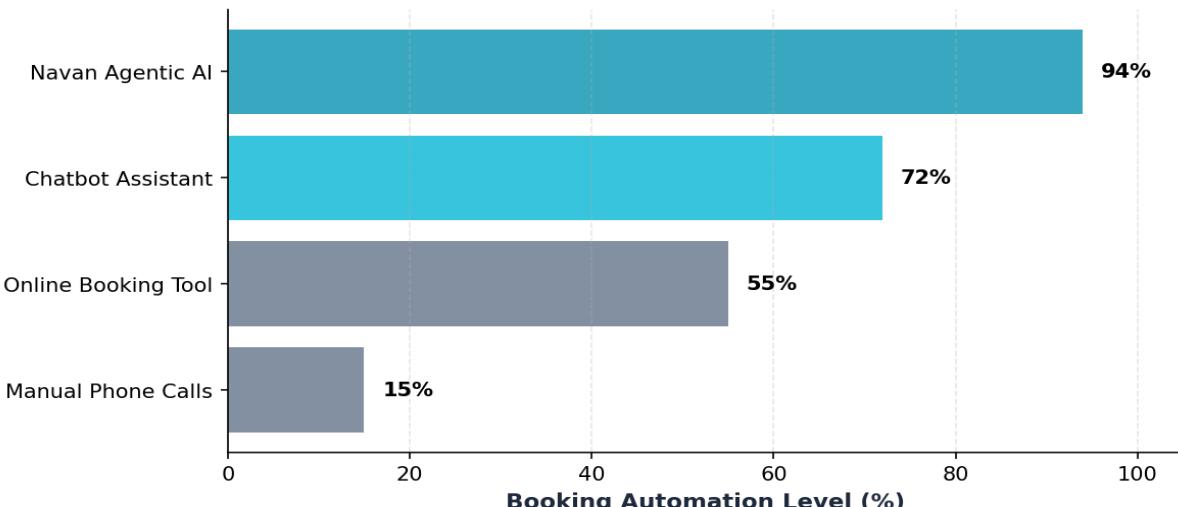
Navan: The Virtual Agent Architecture

• Navan Cognition Framework

- **Zero-Hallucination Guardrails:** Function calling prevents invented flights
- **RAG for Travel Policy:** Retrieves JSON policy objects, not guesses
- **Fiduciary Agent:** Acts on behalf of company budget constraints
- **Grounded Responses:** Only uses retrieved context for decisions

• Hotel Concierge Voice Agent

- **Physical Phone Calls:** Text-to-Speech calls hotel front desk
- **Human Conversation Handling:** State machine manages interruptions
- **Confirmation:** Provides credit card authorization, notes codes
- **Persistence:** Schedules retries if system down, mimics human
- **Problem Solved:** Prevents guest 'walking' at 2 AM arrival



Engineering Breakthrough: Navan's voice agent handles non-linear human conversation ('Hold on, let me check' / 'System is down') using state machines that mimic human persistence, confirming physical hotel reality from digital booking.

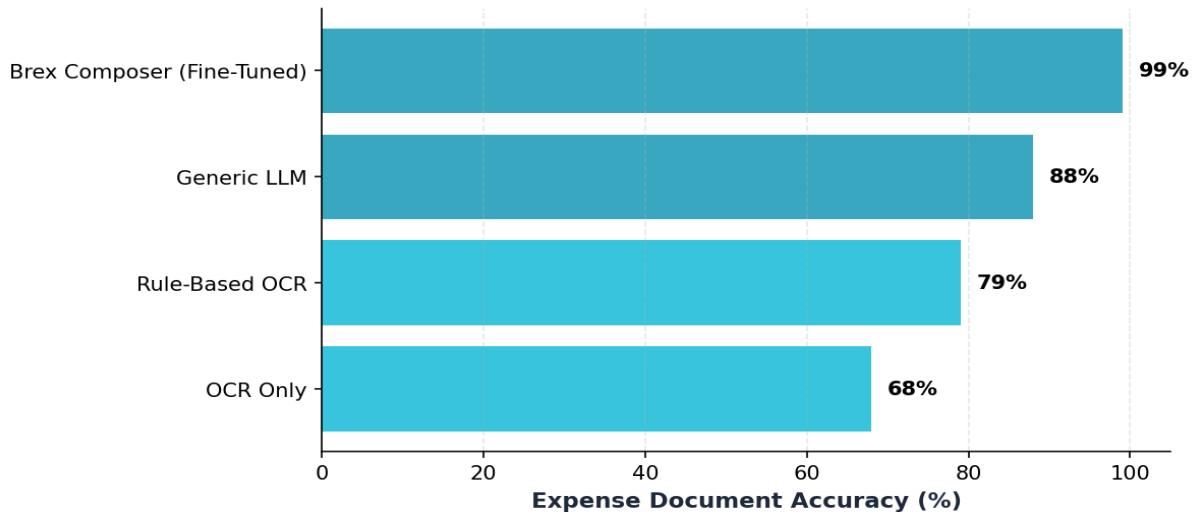
Brex: The Composer & Document Intelligence

• Context Engineering Pipeline

- **Multimodal Analysis:** Computer Vision + text extraction
- **Calendar Integration:** Checks meeting invites to auto-populate attendees
- **Semantic Policy Reasoning:** LLM interprets 'team dinners allowed \$200/person'
- **Dynamic Enforcement:** \$5K for 50 people OK, \$5K for 2 people flagged

• Private Infrastructure for Speed

- **Private GPU:** On-premise inference for instant receipt scanning
- **Fine-Tuned Models:** Llama 3/Mistral specialized on financial documents
- **99%+ Accuracy:** Vertical AI approach beats generic APIs
- **Cost Efficiency:** Lower than calling OpenAI for every receipt



Vertical AI Advantage: Brex fine-tunes smaller open-source models on financial documents, achieving 99%+ accuracy with lower costs than generic APIs. Context engineering combines vision, calendar, and policy reasoning for intelligent expense automation.

Strategic Impact

- **Corporate Card → Corporate Concierge:** AI handles entire workflow
- **Zero User Intervention:** Booking, changing, expensing automated
- **Policy Enforcement:** Semantic reasoning replaces rigid rules
- **Real-Time Processing:** Instant receipt scanning and approval