Next Frontier in ITS: Augmenting Existing Transit Operations Tools Using Emerging Technologies

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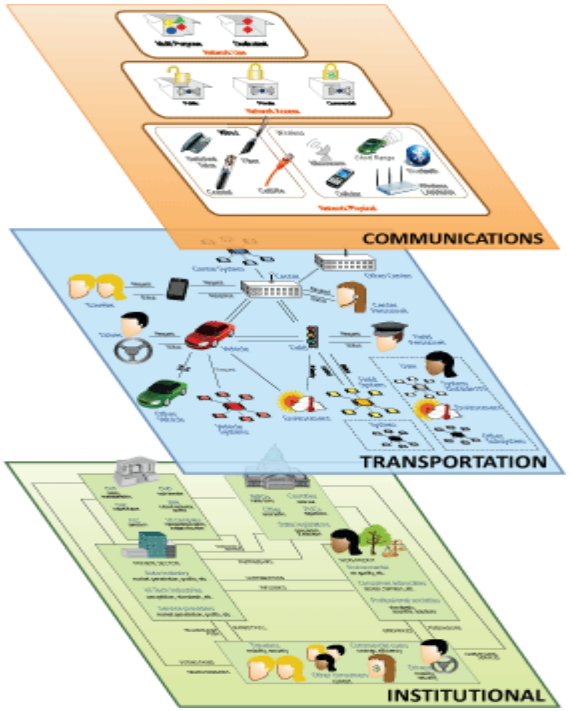
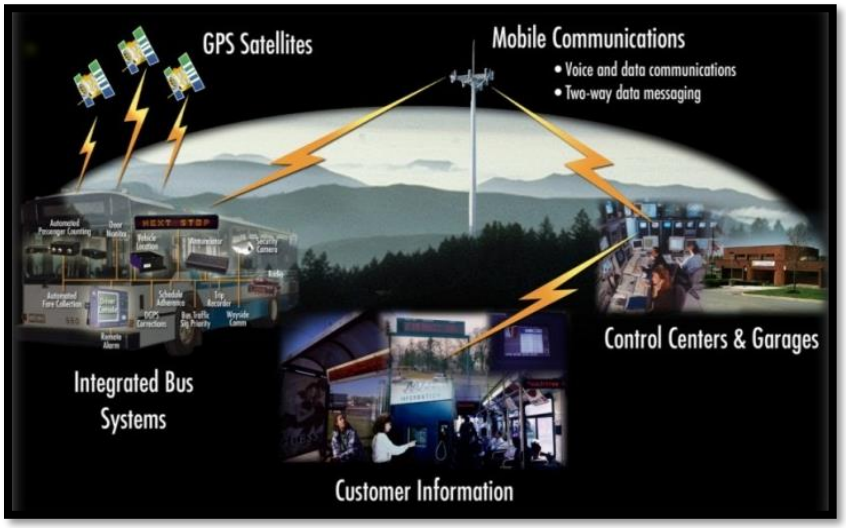
Presentation Overview

- Operations management tools
- Current limitations
- Applicable emerging technologies
- System enhancements
- Implementation constraints
- Future outlook



Operations Management System: Functional Overview

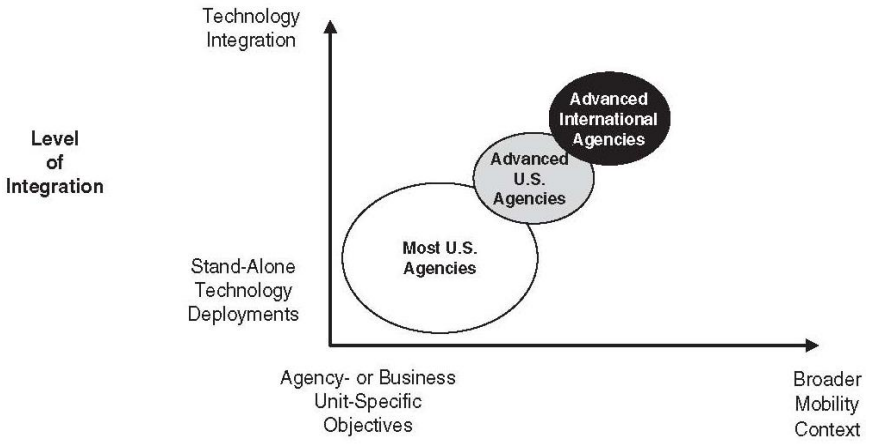
- Location tracking
- Communication
- Event management
- Operations review
- Schedule updates



Source: NTI Systems Engineering

Current System Limitations

- Timeliness of communication
- Limited “playback” features
- Lack of “actionable” information
- Communications tools
- Third party enhancements



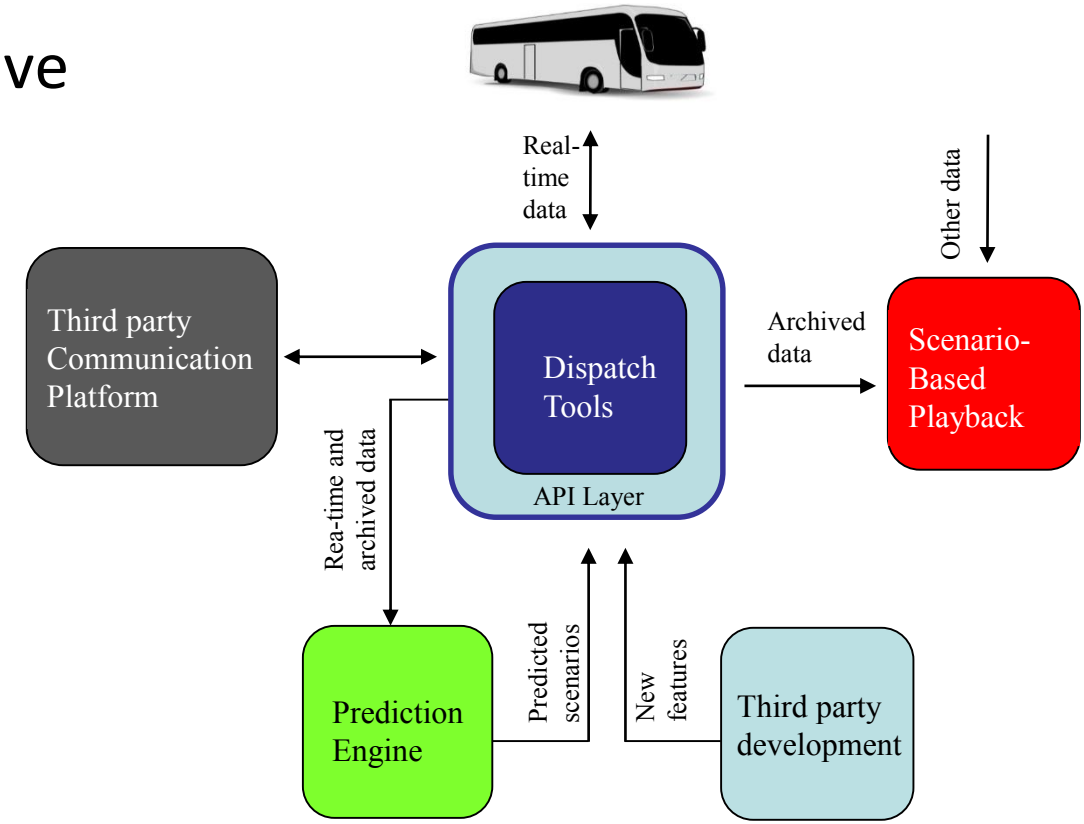
Source: TCRP Report 84-volume 8

Applicable Technology Trends

- Big data mash-up
- Predictive analytics/artificial intelligence
- Data visualization
- Social media
- Crowdsourced development

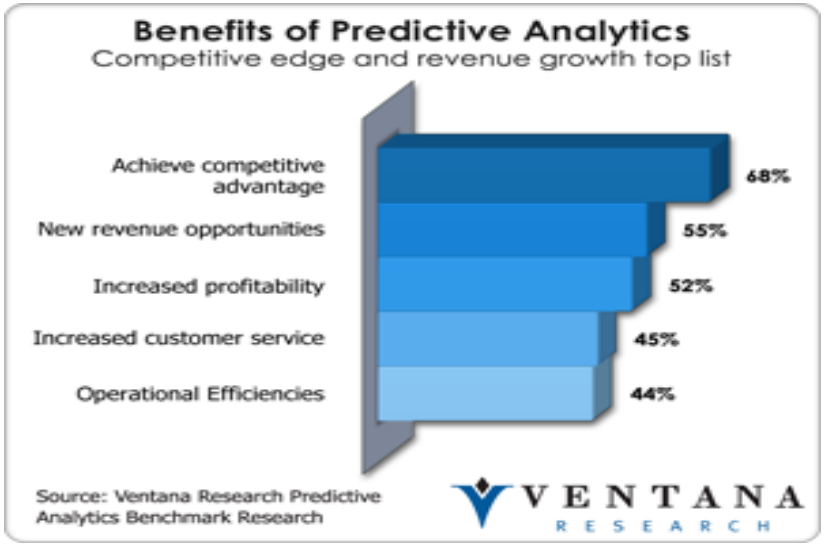
Suggested Enhancements

- Predictive and proactive dispatch
- Enhanced replay
- Feedback loop
- Enhanced communication
- Third party enhancement



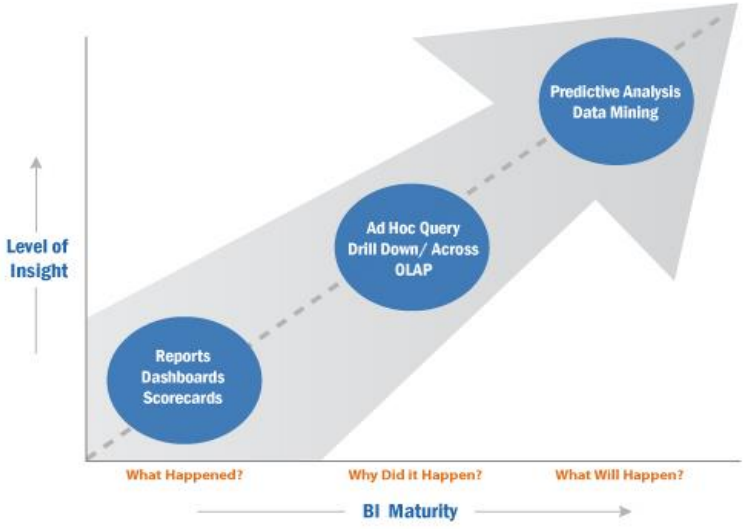
Predictive and Proactive Dispatch

- Data mining
- Prediction engine
- Proactive alerts
- “Crawler” program/problem traps
- Recommended actions for dispatch



Enhanced Replay

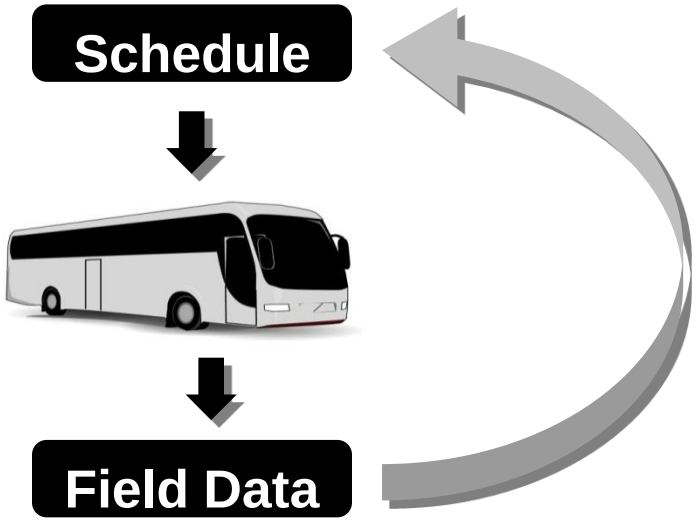
- Enterprise system database
- Simulation of operational scenarios
  - Scenario definition and database creation
  - Scenario search and playback
- Benefits
  - Resource planning
  - Training
  - Safety



Source: witinc.com

Feedback Loop

- Trip running time, cycle time and other scheduling parameters
  - Between timing points; Between endpoints
- Dwell time
  - Expected; Unexpected
- Route structure and stop placements
- Resource allocation and managing other system parameters



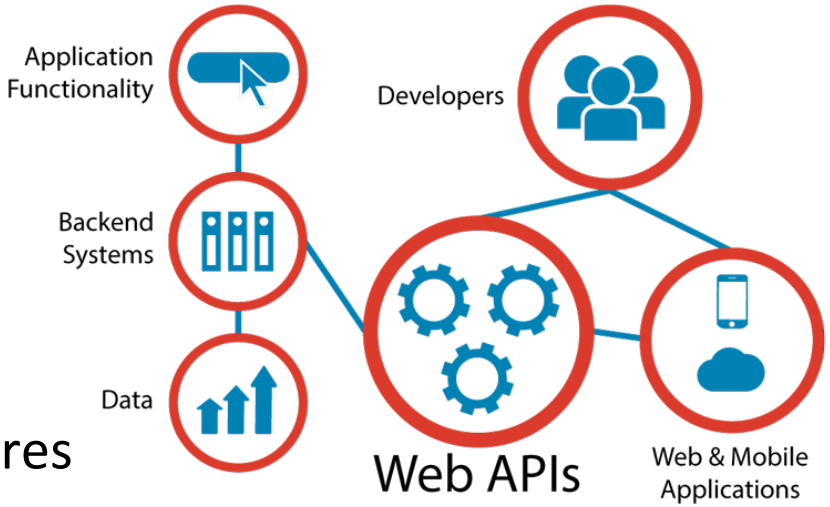
Enhanced Communications

- Mobile access
- Instant communication
  - Chat
  - Video conference
- Real-time online collaboration among users
- Processing of Crowdsourced information
  - Real-time
  - Archived

Source: itinsideronline.com

Third-party Enhancements

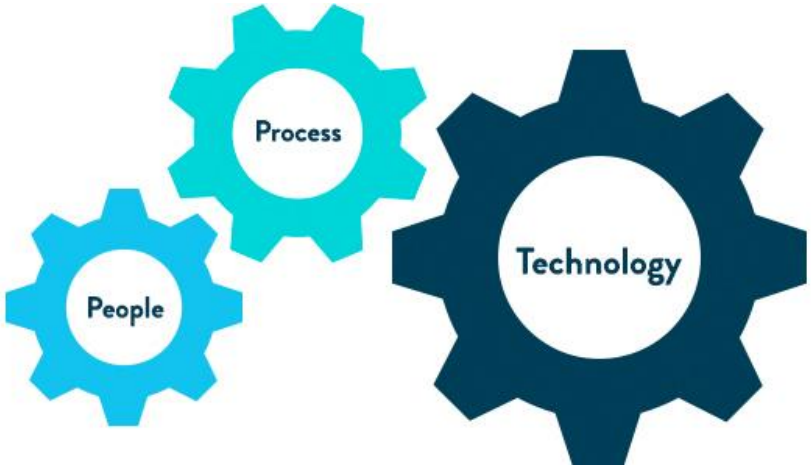
- System integration
- Enhancement tools
  - Developer API
  - Data feed
- New applications
  - Enhancement of system features
  - Enhanced visualization

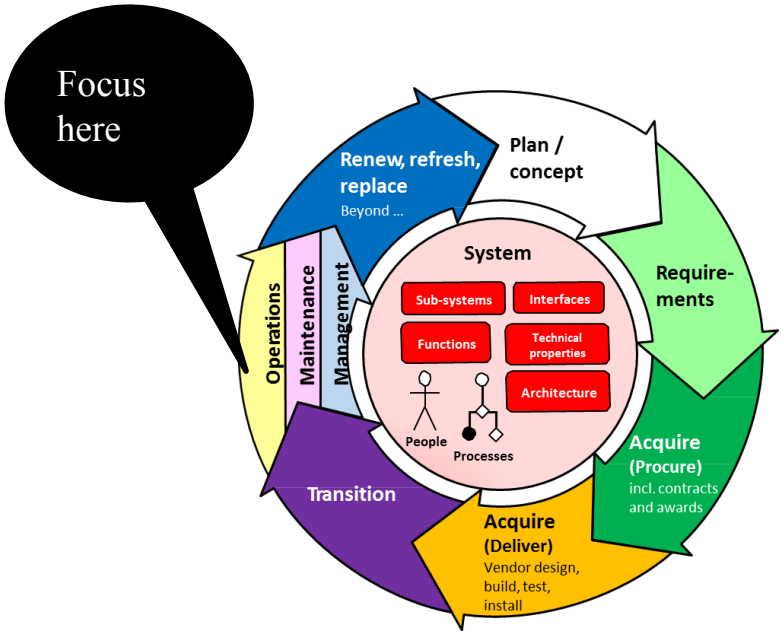


Source: API Academy

Implementation Constraints

- Not a priority; lack of funding
- Limitations with data standards; APIs
- License restrictions
- Lack of in-house resources
- Legacy platforms



Future Outlook

- Strategic focus on system life-cycle; also O&M
- Incremental improvements vs replacement
- Data format standardization
- Partnerships