

Digital Business Transformation for Airports

Trends and Best Practices

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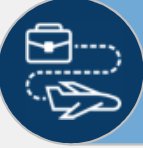



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Examples of technology innovation and business impact contained in this document are taken from the following airports - YYZ, LHR, LGW, CDG, VIE, ARN, CPH, DEL, SIN – and the following other sources - ADL Research; IATA; IBM; Intervistas; GMR Airports Ltd.; SITA; Wipro Ltd.

Six Major Levers of Digital Transformation at Airports

Lever	Technology Solutions
 Customer Experience Improvements	Mobile self-service solutions, Bluetooth proximity marketing, social media integration, Intelligent interactive displays, loyalty solutions
 Passenger Flow Improvements	Location aware beacons, Real-time flow monitoring and control, Geo Location solutions providing information and access to airport facilities
 Airport Process Optimization	AODB, CDM, Mobile / NFC boarding, RFID Baggage tagging, automated building access management, real-time resource management improve asset utilization and operations efficiency
 Airport Economic Lifecycle Optimization	Integrated digital platform for end-to-end design, management and expansion of airports including use of BIM, GIS, real time and intelligent asset, utility and energy management solutions
 Revenue Optimization	Integrated platforms for omni-channel, dynamic and personalized customer interaction; passenger flow optimization to drive higher retail consumption; real-time resource allocation to match passenger flow
 Partnership Innovations	Strategic partnerships to implement business and technology transformation with little to no capital investment, with a focus on tangible top line growth or bottom line improvements

Technology has enabled agent-free execution of key travel processes, and is progressively eliminating traveler-agent interaction points at airports

Process without agent intervention	Adoption	Potential
Booking		
Parking		
Online/Curbside check-in		
Curbside baggage drop		
Security		
Border Control (Outbound)		
Boarding		
Baggage Claim		

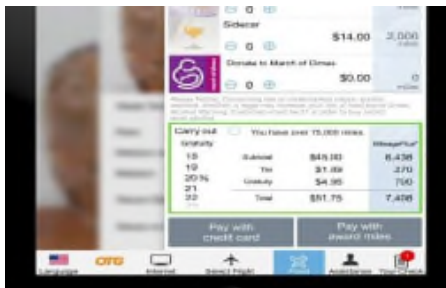
At the Airport

- Provide Wi-Fi, Bluetooth and mobile enabled solutions.
- Monetize traveler eyeballs using digital signage
- Automated gates using enhanced biometrics
- Augmented experience for the connected traveler using:
 - Wireless connectivity and virtual office management
 - Interactive information displays
 - Bluetooth proximity marketing
 - Location aware targeted marketing
 - Mobile based airport and destination information

Pre and Post Travel

- Social media pages to provide
 - Information on travel choices to the airport
 - Storm warnings and workarounds
 - Information on retail, F&B, Car Park and other services

Predictive analytics and enhanced biometrics helps airports proactively act on real-time information about passenger flow and make decisions related to staffing and gate assignments.



At the Airport

- Mobile check-in technologies accelerate check-in and boarding
- Real-time flow monitoring and control ensures:
 - Passengers spend less time in non-value added activities
 - Revenue is maximized by allowing time for retail, leisure and shopping
- Video analytics from surveillance cameras used to open gates and adequately staff security and border control lanes
- Location aware beacons provide real-time wayfinding solutions to optimize passenger flow

Pre and Post Travel

- Self-printing and tagging of baggage tags
- Smart parking with mobile pre-booking
- Real-time notifications about bottlenecks, storm warnings and delays, destination issues, etc.
- Integrated transportation applications

Optimize operations to reduce operations costs, improve capacity utilization, improve physical security and reduce issues related to loss and pilferage



- Airport Operational Database System (AODB) to integrated data from passenger, airline and airport operations
- Predictive analytics using data from AODB helps in operational and executive decision making:
 - Maximizes utilization and throughput of space, check in counters, security and immigration lines, gates
 - Optimizes staff deployment via forecasting and seasonal planning.
 - Reduces airline taxi times and turnaround times
 - Reduces connection times Integrated capacity management across runways, gates and passenger checkpoints
- RFID baggage tagging reduces rate of lost or misplaced baggage
- Roaming agent applications help airline and security agents to authenticate travelers
- Centralized command and control center receives and intelligently processes security feeds
- Mobile/ tablet based hand-held field data entry systems for ground staff, to facilitate visibility of:
 - Support equipment and supplies
 - Power
 - Maintenance

Integrated analytics across asset utilization, capacity and maintenance can drive significant lifecycle savings in airport operations, including supporting higher capacity with existing assets



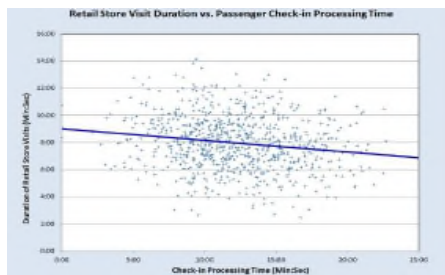
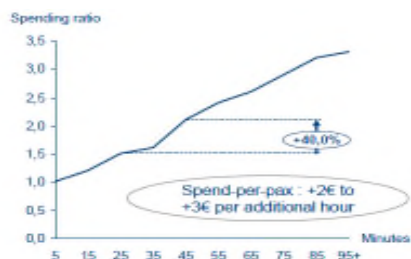
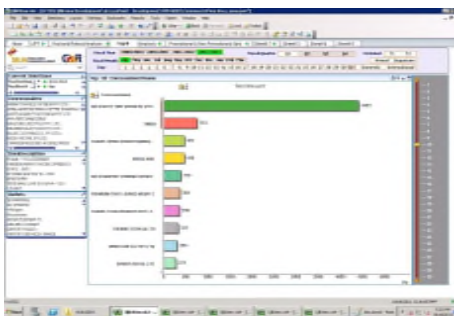
Asset management benefits

- Labour utilization, 10 to 20% increase
- Asset availability, increase 3 to 10%
- Decrease in new purchases, 3 to 5%
- Warranty recovery, up to 50%
- Inventory reductions, 20 to 30%
- Reduced inventory carrying costs, up to 20%
- Material cost reductions, 5 to 10%
- Purchasing cost reductions, 10 to 50%



- Integrated Asset Management and Resource Management systems to :
 - Maximize utilization and throughput of fixed assets
 - Minimize maintenance and pilferage
 - Ensure environmental compliance
 - Assist in recovery from disturbances
- Ensure efficient design, management and expansion of airports using
 - Building information modeling
 - Asset Management
 - Real time and intelligent asset, utility and energy management solutions
- Utilize analytics to define strategy for:
 - Optimization of use of current assets to defer expansion
 - Expansion of fixed assets (terminal, gate, stand, check-in, carousel etc.)
 - Preventative maintenance of assets

Targeted passenger segmentation, dynamic passenger flow management, personalized offers and alternative fulfillment strategies can drive increases in non-aeronautical revenues



- Passenger flow management to optimize dwell time in retail zones
- Integrated omni-channel retail platforms
- Targeted offers based on individualized segmentation
- Tablet and mobile applications to replace inefficient human interactions
- Dynamic allocation of airport resources to match profile of passengers
- Dynamic gate allocation to match passenger profile and flow to retail outlets
- Passenger wallet for secure and accelerated retail transactions
- Pre-order from flights for pick-up-on-arrival
- Ship-to-home, ship-to-flight and pick-up-on-return fulfillment models

Innovative strategic partnership such as Zero-Cost Transformation™ and Digital Ecosystem Partnerships™ drive focus on Net Economic Value Added™ from transformation



Digital Ecosystem Partnerships™

- Integrated partnerships for technology services across sustaining operations, business operations optimization and digital business innovation
- Operational integration with airlines, retail concessions, transportation partners and government agencies to realize benefits of technology innovation

Zero-Cost Transformation™

- Implementation of business and technology modernization at little or no one-time investment
- Gain-sharing models with strategic partners - airlines, retail concessions, transportation partners, government agencies, technology providers - based on tangible revenue growth or cost reduction targets

Net Economic Value Added™

- Focus on tangible economic value in terms of revenue growth and/or cost reduction
- Move away from traditional TCO approach to technology cost optimization

Case Study: Greater Toronto Airports Authority (YYZ)

THE GOAL: Enable rapid growth with limited capital investment, through a new approach to business strategy and technology

Approach:



Defined the top strategic business initiatives related to non-aeronautical revenues, user experience improvement and operational process optimization



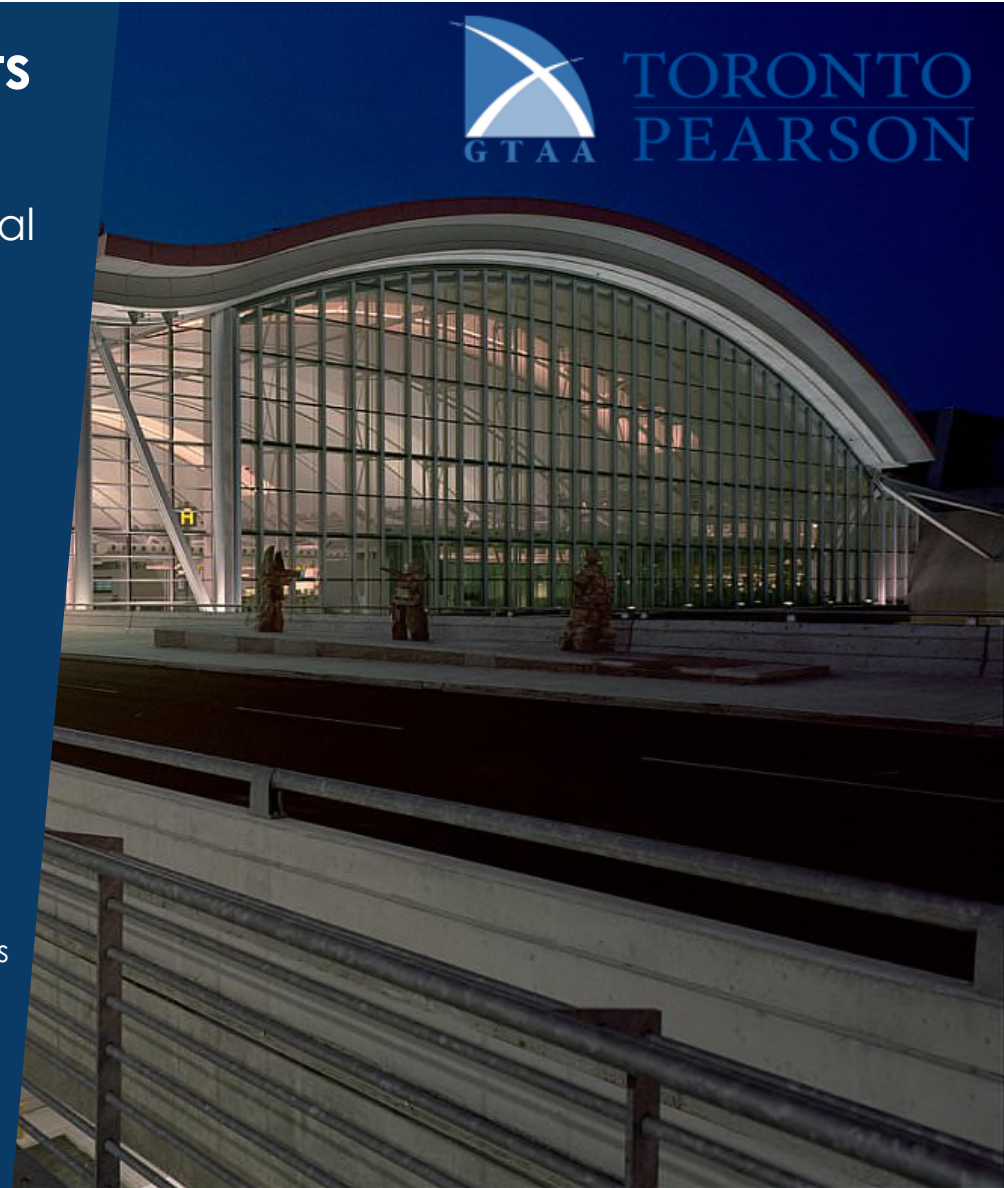
Developed a technology blueprint, road map and sourcing strategy to execute on the business initiatives, based on gain sharing models to promote alignment and ingenuity



- Over 35% committed reduction in IT operations costs
- Identified 20-25% reduction in business operations costs
- Identified 10-15% increase in NAR
- Deferred C\$150M in IT modernization capex
- Deferred C\$3bn in new investment based on optimized operations to maximize capacity utilization



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