

# Punctuality: How Airlines Can Improve On-Time Performance



# Executive Summary

Punctuality is one of the key performance indicators in the airline industry and an important service differentiator especially for valuable high-yield customers. In addition, improved on-time performance can help achieve significant cost savings: Airlines report delay costs from 0.6 to up to as much as 2.9% of their operating revenues.

Consequently many carriers have started initiatives and set up special teams or organizational units to achieve these potential cost savings and service improvements. Although these initiatives can appear to be expensive at first glance, if they are well conducted they can generate significant pay-offs. Research on the performance of major airlines suggests that there is a positive correlation between on-time performance and operating profit. This is a similar phenomenon to that found in manufacturing industry—where the cleanest factories tend to be those with the highest productivity.

Despite the increasing attention that airlines pay to punctuality the industry's on-time performance is still far below satisfactory levels. In 2000, approximately 25% of all flights in the USA and Europe were delayed by more than 15 minutes. A good portion of this can be attributed to increasing congestion of air space and poor operational performance of air traffic control and airport facilities. Nevertheless, the individual improvement potential within an airline's reach is significant.

Exploiting this potential requires a key insight and mind-shift by the airline's management: Punctuality is a key leadership challenge throughout the organization and should rank high on the management agenda—from strategy and planning all the way to front-line operations. In rising to this challenge airlines need to take a strategic perspective and apply a comprehensive framework that addresses the three main levers for punctuality improvement that are within their reach:

- Network planning and control
- Aircraft availability
- Ground operations and departure process

Tools such as simulations, statistical sampling, process monitoring and key performance indicators build the foundation to drill down to the root causes of delays. The key success factor is to merge quantitative analytical rigor with the rich qualitative information from front line observations, know-how and staff experience.

Once agreement on the root causes of delay has been reached, the path to solving the problem is in most cases clear. Quantifying both costs and the benefits of individual improvement measures allows the trade-offs between punctuality, investment, turnover, utilization, and other performance targets to be managed effectively.

By working with leading airlines all over the world, Booz-Allen & Hamilton has developed a proven and comprehensive methodology for improving on-time performance. This Viewpoint outlines our approach to boost airline punctuality to new heights.

## Punctuality: How Airlines Can Improve On-Time Performance

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Airline punctuality is in the headlines. Hardly a week passes without an article in a newspaper, magazine or airline industry journal discussing the issue of poor on-time performance and its impact on the industry and on society at large. In 2000, 25.5% of all intra-European flights were delayed more than 15 minutes, the second-worst ever result after 1999, when the Kosovo conflict severely disrupted flying over parts of Europe. The picture was equally discouraging in the U.S. where 27.4% of the major airlines' flights were delayed in 2000. In other words: in at least 1 out of 4 airline travel experiences, customers will experience their plane leave or arrive late. This is a “defect rate” that would not be acceptable to anyone buying or selling any other kind of product or service in the 21st Century.

Although a high proportion of delays can be attributed to increased congestion in air space, and the poor performance of ATC (air traffic control) and airport services, it is ultimately the airline, that the customer will blame. This is a criticism the airline will find hard to afford, especially in view of the competition for valuable high-yield customers.

On top of the negative impact on customer satisfaction, delays are expensive. Direct and indirect delay costs typically range from 0.6% to 2.9% of revenue, depending on the size and type of operation and the method of calculation.

This combination of significant revenue and cost-side effects is why punctuality should rank high on top-management's agenda.

Achieving punctuality is a leadership challenge throughout the organization—from strategy and planning all the way to front-line operations. However, there are many levers that airlines can pull to address this challenge.

## A Brief Look Into History

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It is not only today, in our fast-moving business world, that punctuality matters. History has seen many famous advocates of punctuality.

About 200 years ago, King Louis the 18th of France used to say, "Punctuality is the politeness of the kings". Very appropriate words indeed, as every airline wants to be both polite to customers and be the king amongst its competitors.

G. E. Lessing, a German critic and dramatist, took a similarly encouraging view of punctuality when he said, "The best proof of good education is punctuality".

However, there have also been some famous skeptics, just as one will find skeptics in airline management with regard to the importance of punctuality relative to other business objectives.

About 100 years ago, Franklin P. Jones, a U.S. businessman and the CEO of the American Management Association, alleged that "The trouble with being punctual is that nobody's there to appreciate it." And the famous Oscar Wilde affirmed that "Punctuality steals the best of our time."

Indeed, some celebrities of the past seem very familiar with current airline departure processes: The comedian Bob Hope stated "Punctuality is the art of estimating correctly, how long the others are going to be late". (He

traveled extensively throughout his life and, when asked how many places he had visited, he used to reply "not as many places as my luggage".)

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*"Punctuality is the art of estimating correctly, how long the others are going to be late."*

Bob Hope, \*1903, US Comedian

*"You can compare ordinary society with Russian horn music, where each horn has only one note to play, and only the punctual coinciding of all results in music."*

Arthur Schopenhauer, 1788-1860

German philosopher

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Finally, a quote from someone who would have thoroughly understood the fine art of running a punctual airline, Arthur Schopenhauer, a German philosopher who lived over 150 years ago. He said, "You can compare ordinary society with Russian horn music, where each horn has only one note to play, and only the punctual coinciding of all results is music."

## Punctuality Does Matter

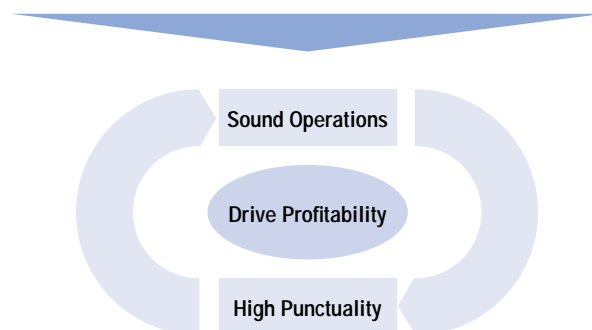
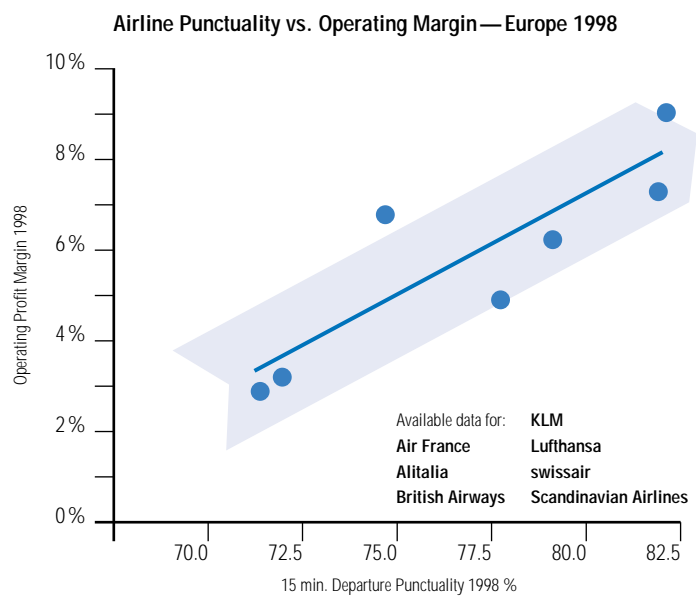
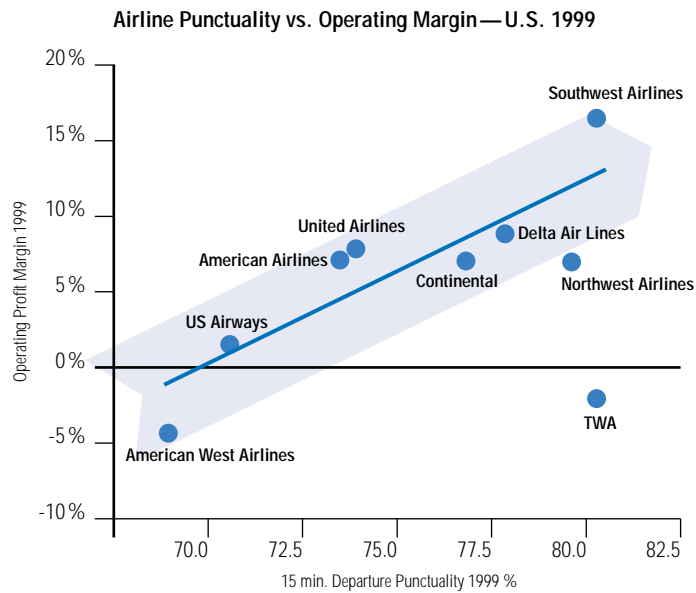
Punctuality differs widely between airlines. It has become a competitive differentiator, both in positive and negative ways—and customers do care strongly about it. When following newspaper headlines it is clear that airlines are active in sharing good punctuality performance with the world, and when they have problems with their punctuality, it is unlikely that the world will not quickly hear about it in the press.

More importantly, however, punctual airlines appear to be more profitable. Our research shows that major airlines with above average punctuality rates have been more profitable than those with lower than average punctuality performance. This finding applies both to major U.S. and European airlines (exhibit 1).

Despite the statistical limitation of such analyses the data strongly supports an “old wisdom” of the industry: “Sound operations will support high punctuality rates; while the pursuit of high punctuality targets helps to create sound operations, which in turn drive increased profitability”.

This sets a clear goal for operations: strive for outstanding and consistent punctuality performance.

### Exhibit 1. Punctuality and Profit



Source: AEA, DOT, ATI, press releases, BA&H Analysis

## Delay Costs and Punctuality Trade-offs

According to AEA (the Association of European Airlines) the average punctuality for intra-European flights was 74.5% in 2000. Our research shows that a top-10 carrier performing at around this level carries €100 to €400 million in annual delay costs.

For each percentage point improvement in punctuality there is a potential profit improvement of €4-16 million, depending on the size of the airline (exhibit 2).

Acknowledging this cost relevance of punctuality, top management must take a firm stance on at least two major trade-offs:

- **Punctuality vs. turnover and yield**
- **Punctuality vs. cost and equipment utilization**

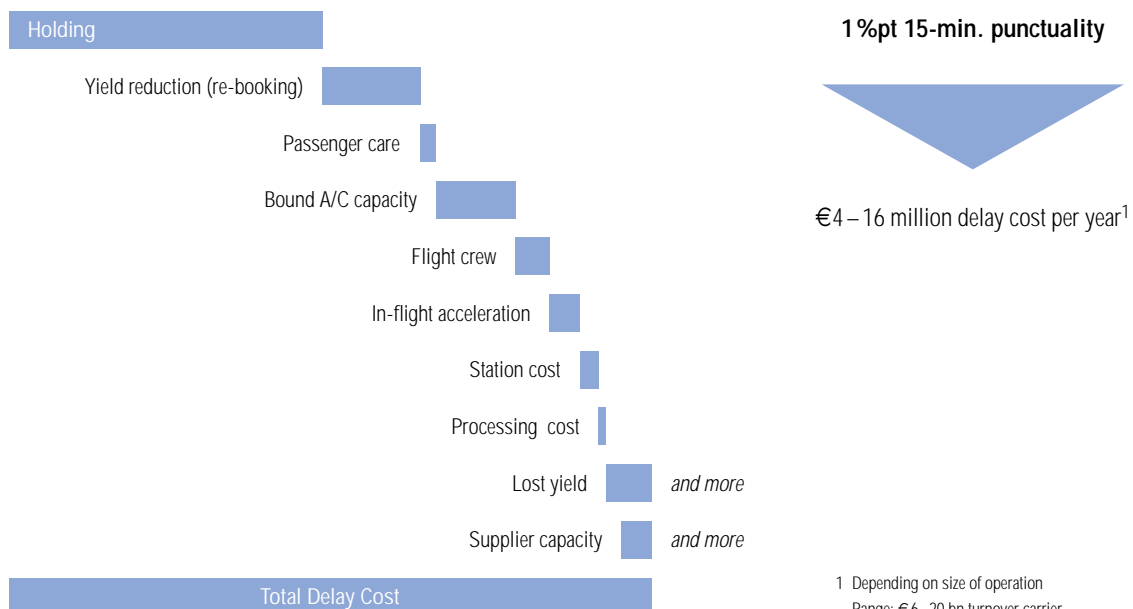
● **Punctuality vs. turnover and yield.** Short-term revenue considerations such as display visibility in the global distribution systems (GDS) do in most cases work against punctuality. Maintaining slots at peak times during the day, short connecting times and tight block times are valid sales-based arguments. However, they may ultimately result in poor operational performance, and may

therefore become counter-productive to revenue maximization in the long run.

● **Punctuality vs. cost and equipment utilization.** One of the most obvious and easy measures to increase punctuality is to remove bottlenecks and add capacity (e.g. the number of aircraft, longer block times, and more ground staff and equipment). Without a solid quantitative business case, based on analyzing potential savings from avoided delay costs, it is unlikely that a controller will support such ideas, especially as most of the savings are variable while the capacity increase builds up fixed costs.

### Exhibit 2. Airline Delay Costs

Typical Delay Cost Breakdown — Client Example



Source: Booz, Allen & Hamilton

<sup>1</sup> Depending on size of operation  
 Range: €6 - 20 bn turnover carrier

## Setting the Punctuality Target

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Punctuality performance differs widely across airlines. Europe has seen a span of performance of up to 30%-points during certain months. It seems difficult to achieve and maintain punctuality levels of 85% and above.

Punctuality targets are usually defined in terms of 15-minute punctuality, i.e. a flight is still counted as departing on-time, if the plane goes off-blocks within 15 minutes of the scheduled time of departure.

Using this approach the industry allows itself to “steal” 25% of the average travel time on a domestic flight in Europe. The argument that a 15-minute departure delay still allows on-plan arrival is not really valid. Although on-time arrivals are important for connections and the execution of the rotation plans—in the awareness of the traveler’s mind it is departure punctuality that defines his or her impression of an airline’s on-time performance.

Consequently the 15-minute bar is not appropriate—especially for short haul operations. Ultimately, this means up-front acceptance of failure.

In a similar way to the total quality movement or six sigma philosophy applied by leading firms in the manufacturing sectors, it is mandatory to strive for a zero-defect strategy in the turnaround process. Allowing, for example, a 95% on-time performance (i.e. a failure rate of 5%) at

seven supporting sub-processes for the departure (the total number of such support processes is actually much higher) will in combination lead to only a 70% on-time departure rate. This means the targets for the sub-processes have to be set much higher—but how can this be realized if the airline industry’s quality understanding of the end product allows 15 minutes or 25% slack?

## Three Main Levers to Push Punctuality

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An effective framework for approaching punctuality in a structured way should use three main levers (exhibit 3, page 6):

- **Network planning & control**
- **Aircraft availability**
- **Ground operations & departure process**

## Network Planning & Control

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Sound network planning and control is the foundation for high punctuality. Our work with clients, which has included extensive analysis and simulations, enables us to quantify the proportion of delays which are inherent in the schedule and the rotation plans.

Statistical capabilities are extremely important in the airline planning process. The capability to execute complex simulations is

a critical tool for understanding schedule dynamics. A capability to carry out what-if analyses is crucial for simulating schedule changes and quantifying their impact on punctuality.

The fine-tuning of simulations is best achieved by using real historical data. Therefore, it is critical that airlines capture operational data, in real time if possible, and use it to feed the systems used for schedule simulations and planning.

The first step to overcoming poor planning and control, is to develop an **integrated planning process**, in which all the planning entities work in the same context and, if possible, use the same systems—or at least the same timetables and rotation plans. Harmonization of the level of detail used throughout the planning process is important; the plans for each function must connect seamlessly to those of prior and consecutive functions. Achieving a high level of detail early in the process can be cumbersome, but in our experience, it will result in a more stable operational platform.

A sound **network structure** and appropriate **block, ground and slack time deployment** are key to a good plan. Adding slack time is expensive. A possible solution is to identify the flight numbers where the punctuality impact on the total schedule is the highest—the “star flights”—, add some appropriate buffers for them and in reverse tighten time frames for other, less critical flights.

The **operational procedures** on the execution day (“day zero”) are another critical success factor.

Defining an operations control “center of gravity” is of utmost importance. Some airlines still run separate planning and control centers for the major operational functions. These have to be centralized, or at least work closely together and be driven by integrated processes, systems, and a common command structure.

Hub operations in particular struggle with **on-time performance at peak times** when their own network knots coincide with highest traffic loadings. Managing this problem requires the airlines explore new ways to share the airspace, either in concerted actions with other airlines, ATC providers, airport operators and regulators or by driving for new market driven methods of slot allocation.

Effective **strategies for recovering** from ‘disaster days’ are also very important to deliver sustainable, high rates of punctuality. To start tomorrow’s operations effectively airlines must consider canceling some flights if necessary—yes, take a hit on the holy schedule regularity. This will pay off in the increased stability of the overall system.

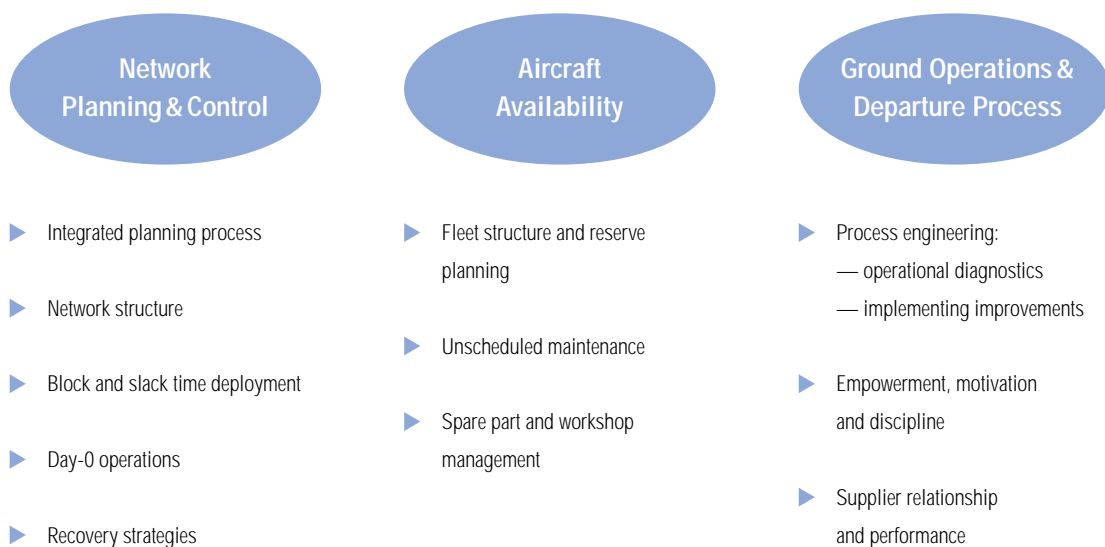
## Aircraft Availability

Aircraft availability is the second main lever in the punctuality framework. If the punctuality target is really taken seriously it needs to have an impact on fleet planing and structure.

It is not only the sheer size of the fleet that is affected, it is also about the variation within and across the aircraft types.

Vulnerability to version and equipment changes, or spare part logistics problems, has a direct impact on the ability to quickly restore punctual operations after irregularities. Punctuality management needs to raise this problem early with the network and fleet planners.

### Exhibit 3. Three Main Punctuality Levers



Source: Booz Allen & Hamilton

If, as a result, the airline decides to increase the number of reserve aircraft it is critical to deploy them carefully and not in a sweeping fashion. Monitoring their deployment avoids the tendency to simply use them as a buffer for maintenance requirements.

**Unscheduled maintenance** is a major driver of low aircraft availability rates. This is especially true for intensive hub and spoke operations with tight rotation plans. The direct impact on punctuality is not surprising (exhibit 4).

## Ground Operations and Departure Process

Significant improvements in on-time-performance at a low price—without major capacity investments and undue impacts on the sales front—can be achieved through focused **process engineering** in ground operations and in the departure process.

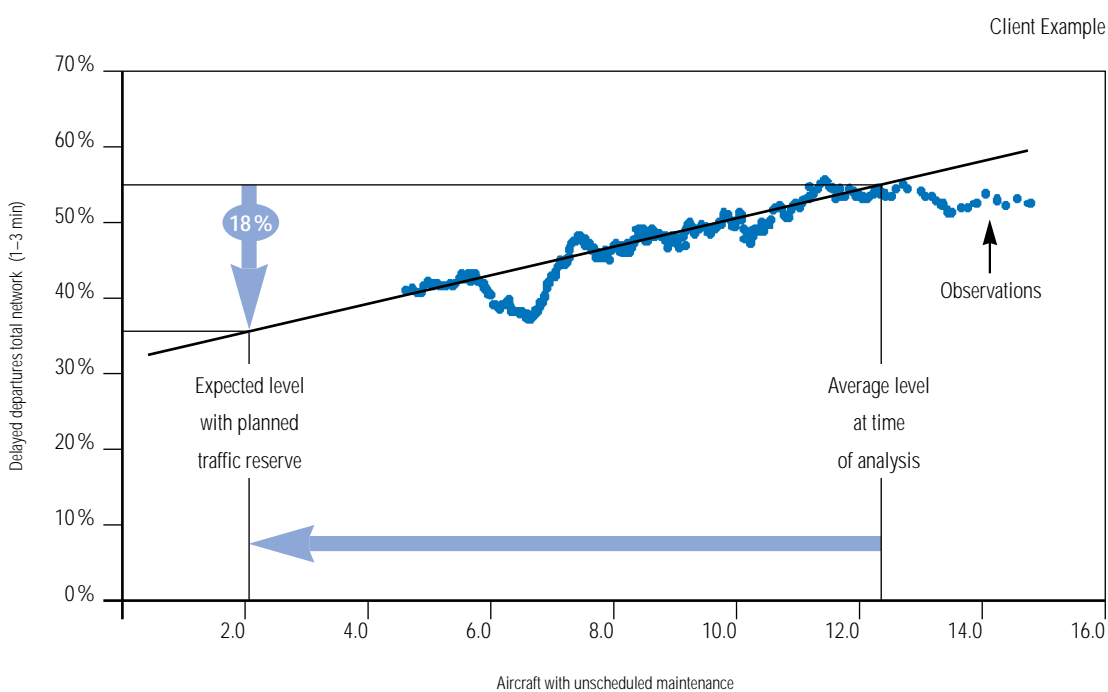
This entails thorough operational diagnostics, followed by a careful design of the multitude of tasks that build the departure process as well as the implementation of the improvement measures.

Sound ground operations are based both on solid up-front plans and process designs as well as

on highly motivated people. The empowerment of front line staff, combined with a high level of discipline supported by adequate incentive schemes do more for punctual operations than millions of investment dollars spent at the wrong areas.

Ground operations are increasingly outsourced by airlines, with the expectation of (at least) equal service levels but at lower—and most importantly—variable costs. Our observations show, however, that airline operations typically do not have the processes and systems in place that are necessary to monitor supplier performance in an adequate way. Traditional airline supplier measurement systems focus on costs and product quality, whereas

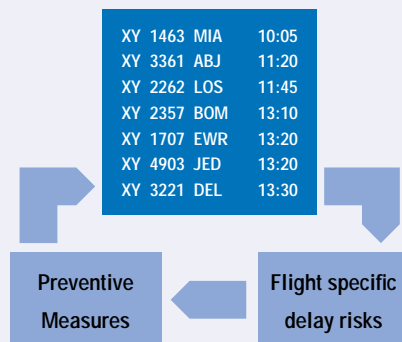
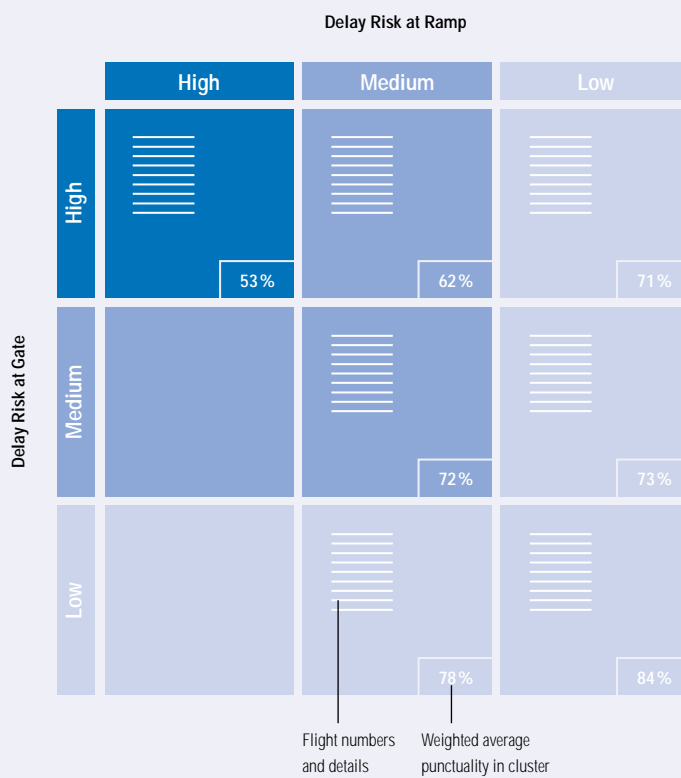
**Exhibit 4. Effect of Unscheduled Maintenance on Punctuality**



Source: Booz-Allen & Hamilton

## Case Example: Preventive Measures in Ground Operations for Critical Flights

The example below illustrates the importance of identifying the critical departures that cause most of the delays. The Booz-Allen & Hamilton team clustered the flights into different categories depending on delay risks at the gate and delay risks at the ramp. These specific delay risks were identified using quantitative data and input from staff interviews. This in turn allowed to design specific preventive actions for each of the flights, which were readily adopted by station control, ground staff and suppliers. Focusing preventive measures and specific flights significantly raised the overall departure punctuality.



Source: Booz-Allen & Hamilton

assessing timely performance on a minute-by-minute scale is not widely applied.

This is a major deficiency in the case of the very complex multi-user and multi-participant ground handling processes. Here, the famous “extended enterprise” approach to managing the entire process beyond organization boundaries can be an effective remedy.

Performance indicators related to critical milestones throughout the whole departure process are essential and it is particularly important to integrate them with well-designed contractual agreements with the suppliers.

## Tackling All Three Levers

Experience shows that there is no single ‘silver bullet’ that will fix punctuality problems. Airlines need to use all three of the main levers described above simultaneously in order to be successful.

The potential contribution of each area will obviously depend on the airline’s specific situation, but it can be determined using analyses that identify the ‘real’ delay root causes and their relative importance.

## Identifying the ‘Real’ Delay Root Causes

Delays are seldom the result of one single factor. In the most cases different failures in the multitude of the supporting processes for flight departure occur together. Traditional (IATA) delay code based monitoring systems do not adequately account for these complex inter-relationships. Also, the inherently restricted ‘myopic’ perspective of the people actually involved in the process prevents an assessment of the root causes based upon experience alone.

The typical departure process is built up from a highly interconnected web of simple, in some

cases almost trivial activities. It is the number of different parties and suppliers which are typically involved that creates the complexity—and exacerbates the problems.

In such a system, things can go wrong, and they do go wrong. When this happens it is easy to identify the last and most obvious disturbance or event that occurred in the process, and report that as the cause of delay. This is the major shortcoming of delay codes, which usually attribute too much weight to downstream processes near the scheduled time of departure.

There are three basic approaches to identify the ‘real’ root causes of delays and to define improvement levers (exhibit 5):

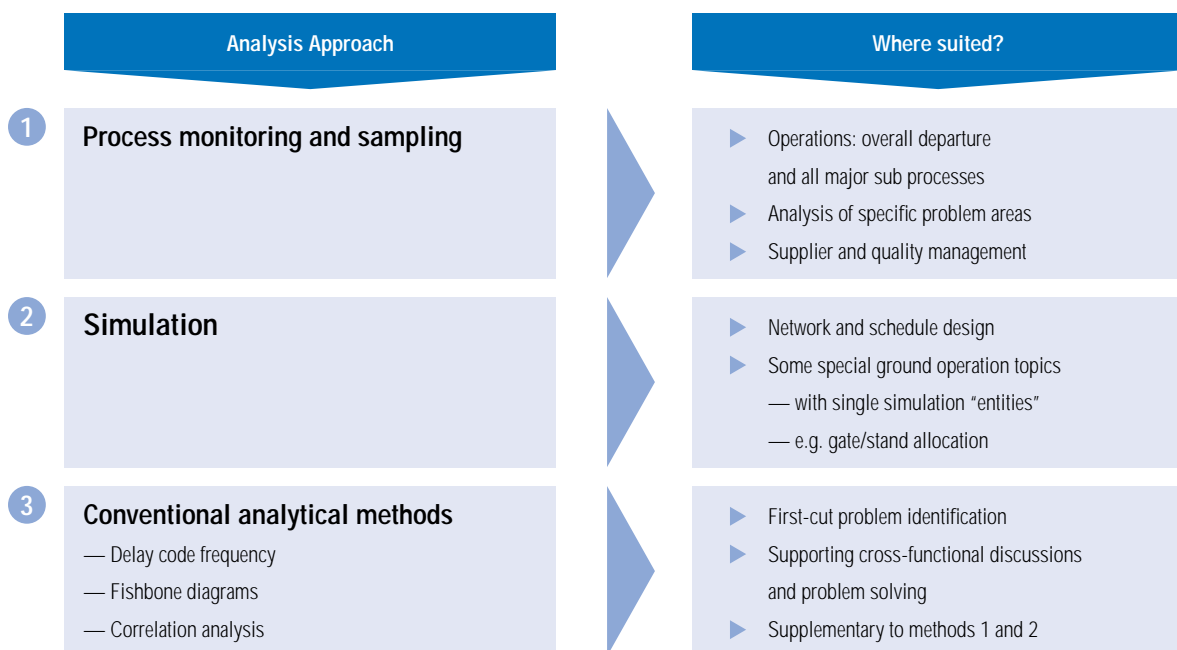
- **Process monitoring and sampling**
- **Simulation**
- **“Conventional” methods**

## Process Monitoring and Sampling

“Process Monitoring and Sampling” establishes a database to evaluate process performance in the overall departure process, supplier processes, and the activities in problem areas.

Process monitoring requires that key milestones in the departure process are defined and measured. Some airlines conduct spot checks on such milestones, taking samples from a number of flights

**Exhibit 5. Three Approaches for Identifying the ‘Real’ Delay Root Causes**



Source: Booz-Allen & Hamilton

on a regular basis; others go as far as using automated electronic time-stamps that feed into online monitoring systems. Although such systems can require significant investment, the increase in operational transparency will pay off (exhibit 6).

Data from process monitoring allows the dissection of the departure process, identifies the origins of delays and the impact on the overall airline delay rate.

The key success factors are analytic rigor and the use of a systematic top-down approach that continuously asks the question “So what’s the ‘real’ root cause behind that apparent root cause that we need to remedy?”

## Simulation

The Monte Carlo simulation of the rotation plan is a very powerful tool for evaluating and optimizing the schedule. Simulations are also useful to plan certain ground activities such as gate allocation.

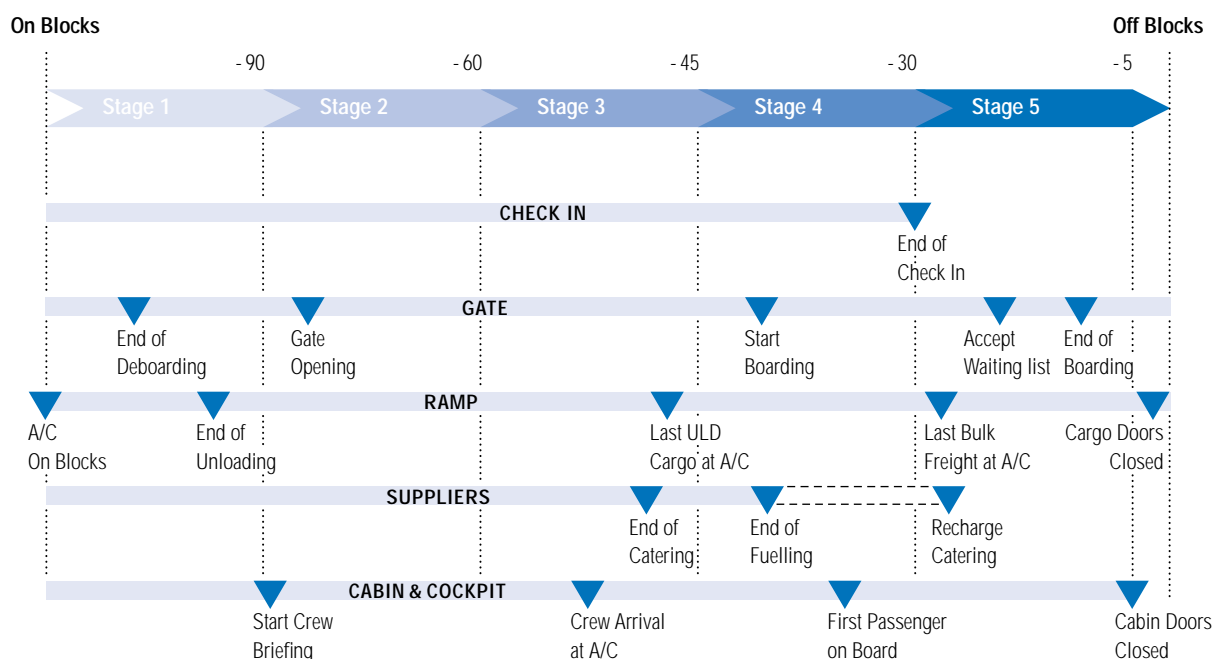
The expected outcomes of Monte Carlo simulations are:

- The effect on punctuality of variations in isolated parameters such as block hours, slack distribution, etc.
- The impact of external factors such as ATC delays
- The identification of the critical lines of flight in the rotation plan—those lines that are most sensitive to poor execution

Simulations will not tell how to solve executional problems, but they will put an end to some of the company’s myths such as “we cannot do anything to improve punctuality because all the problems are due to ATC”.

One example of the use of simulations is in demonstrating that there can be a positive punctuality outcome from using variable block times for a segment depending on the day of the week and time in the day, instead of using the same average block time plus one standard deviation on all flights of this route.

**Exhibit 6. On-Time Departure Depends on the Punctuality of the Milestones in Each Sub-Process**



Monitoring the punctuality of each Milestone

Source: Booz, Allen & Hamilton

## “Conventional” Root Cause Analysis

This category covers the conventional methods of analysis used in most airlines, for example, delay code frequency, fishbone diagrams and correlation analyses.

In the initial stages, these methods can help identify the broad picture and provide a first cut understanding of the major problem areas.

These methods also work well to generate agreement in cross-functional discussions and workshops, as they are easy to understand and based on the immediate experience of staff.

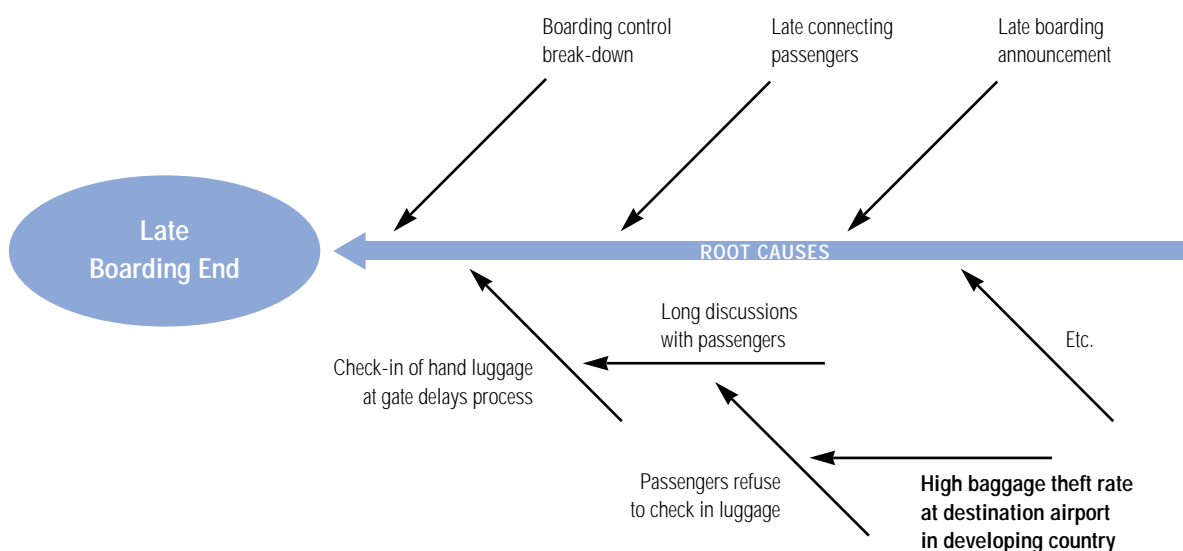
Many airline executives distrust the delay codes reported by the front line. Nevertheless, they are helpful to highlight major problem areas. A pragmatic interpretation is that systematic failures in delay code allocation are at least consistent over time. Therefore, they can provide data on delay patterns that highlights short- and long-term trends in certain “delay areas”.

When using delay codes, it is important to understand that they will not provide information on the upstream problems that may have had more influence in creating the delay than the reports suggest. Still, delay codes often represent the best quantitative knowledge on delays that is available in many airlines.

To identify and understand the root causes it is necessary to leverage the knowledge of the staff. The people working every-day in the key processes do know many of the root causes but this information is often not reported. Listening to them one by one may be frustrating, but their individual statements are like pieces in a jigsaw puzzle that reveal the true picture when put together. Exhibit 7 shows an example of the traditional fishbone diagram that can be used to put staff statements into perspective and trace delays to their root causes.

One thing that is often forgotten is to analyze the good days. There is an untapped resource of information, often neglected by solely focussing on a problem-

Exhibit 7. Leveraging Front-Line Observations in Root Causes Analysis



Source: Booz-Allen & Hamilton

oriented approach. Our experience is that it is important to study the perfect days on a regular basis to better understand the causes of delays.

## Reaching Agreement on Delay Causes

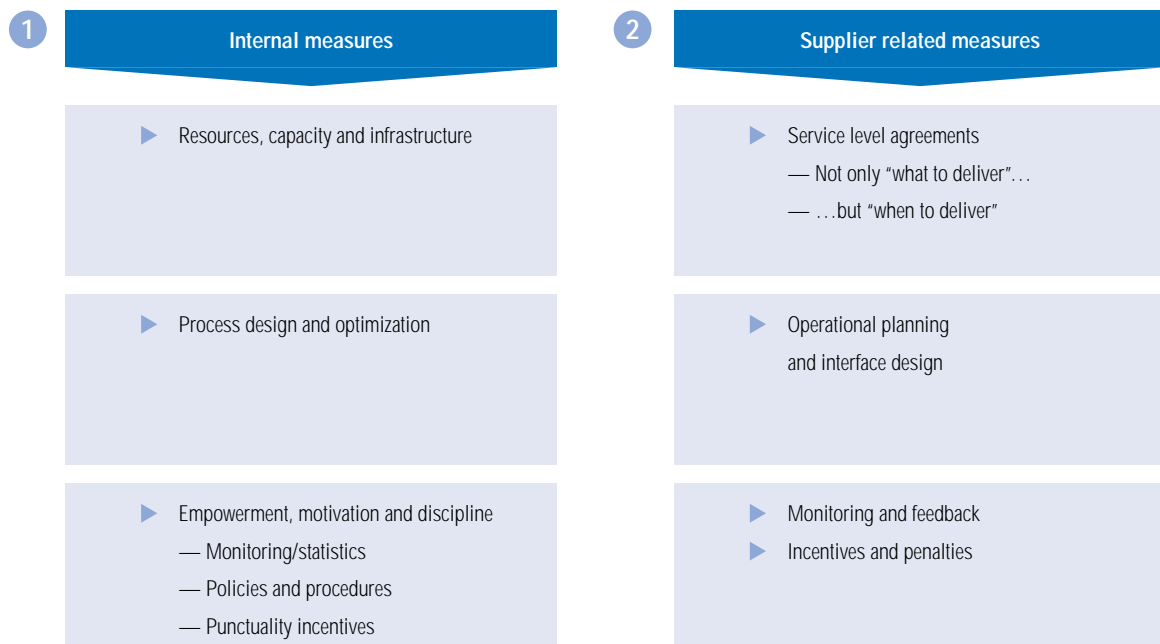
Once all the facts have been collected, it is of utmost importance to reach agreement amongst all the key parties involved on the root causes of the delays.

Regardless of the method of analysis used, the results must identify problem areas, root causes and their order of magnitude. It is important to spend time on this effort until a common understanding of the problems is reached, otherwise most of the impact of the analyses on future performance will be lost. This is because, without this consensus, the search for solutions will continue in fruitless circles. Management and staff will dig deeper into their trenches. If they stick too defensively to their individual truths and perspectives during the process, there will be no real commitment and driving force to change.

## Solving the Delay Problems

As soon as the root causes are visible and agreed on, the path to remedying them is usually clear and the different improvement options can be evaluated. These options typically fall into two categories—internal measures and supplier related measures (exhibit 8).

### Exhibit 8. Solving the Delay Problems



Source: Booz, Allen & Hamilton

**Internal measures** include:

- Resources, capacity and infrastructure. These refer to measures such as using dedicated resources for critical processes, reserve aircraft, or investments in system improvements.
- Process design and optimization aiming at doing things in innovative new ways, which have not been thought of or attempted before.
- Empowerment, motivation and discipline. These factors include incentives, new policies, clear roles and responsibilities for the staff involved.

**Supplier related measures** include:

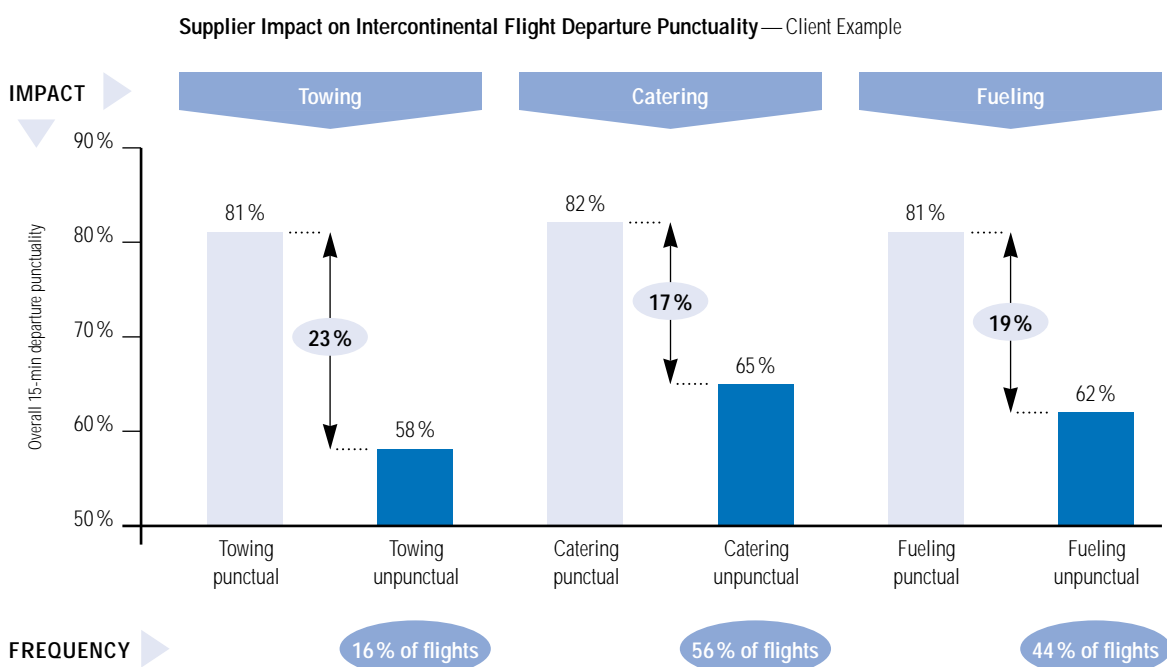
- Service level agreements, which address not only *what* to deliver but also *when* to deliver it.
- Operational planning and interface design, integrating the activities and processes of each supplier within the entire network of operations.
- Continuous monitoring and feedback as well as incentives and penalties which close the feedback loop in the supplier relationship and which assign clear “consequences” to good or bad performance levels.

## The Importance of Supplier Management for On-Time Performance

Supplier management is vital for on-time performance. If key suppliers do not finish their processes on time, the resulting overall punctuality will drop significantly. As an example, exhibit 9 shows the impact of unpunctual towing, catering, and fueling processes on the overall departure punctuality for intercontinental flights.

An important prerequisite for supplier management is to provide both parties—airline and supplier—with clear data on the

**Exhibit 9. Impact of Supplier Punctuality on Overall Departure Punctuality**



Source: Booz-Allen & Hamilton

actual performance versus agreed targets.

The use of such information should also be reflected in effective service level agreements. This is a weak spot in many airlines that have outsourced formerly internal functions. To improve performance the contracts with suppliers may have to be revisited to ensure that they include clear deadlines for supplier processes.

Many airlines do not have these basic contractual elements in order. To overcome this situation, commercial purchasing units, representatives from the operations and product management need to act as a team and agree on the performance levels.

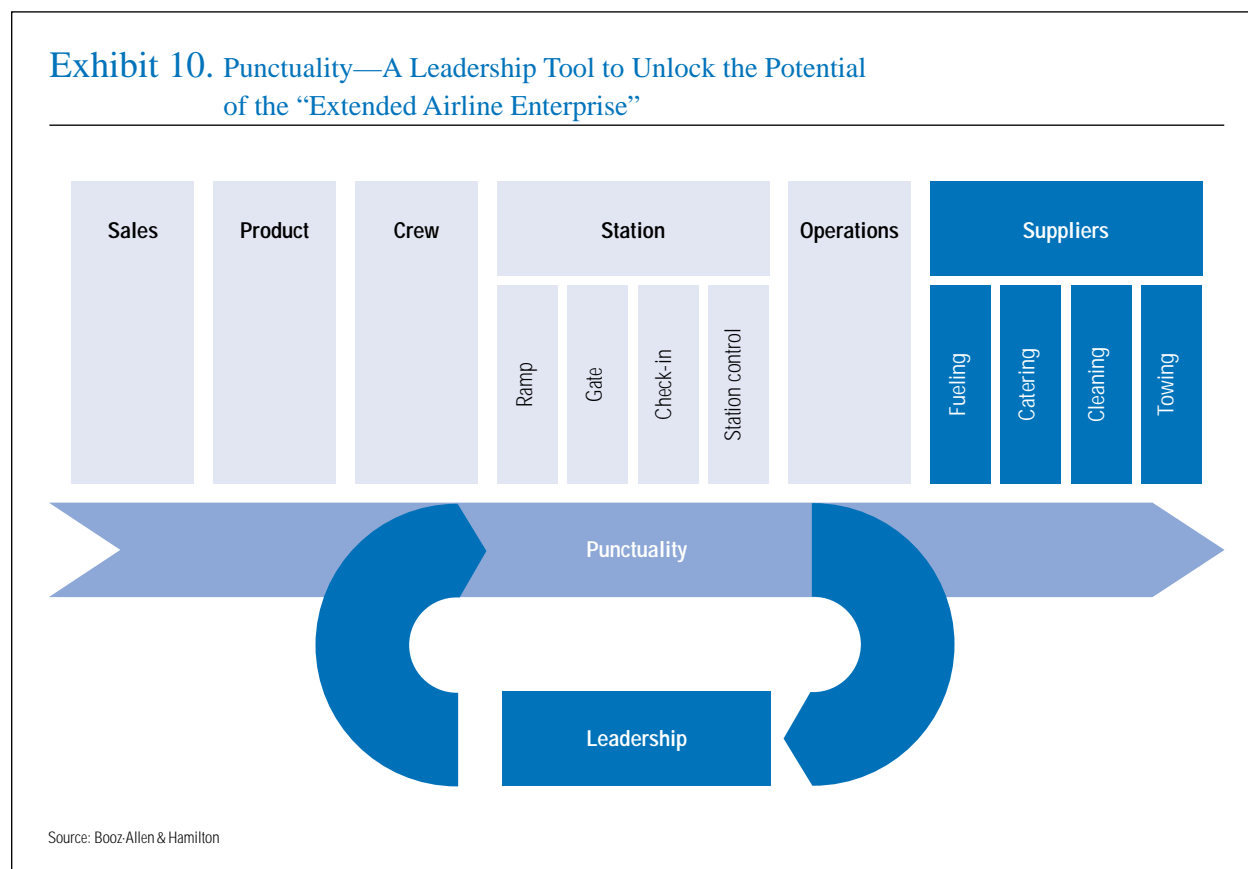
## Punctuality and Leadership in the Cross-Functional Environment

Airline operations are characterized by a multitude of cross-functional, network-type processes that, in contrast to fairly stable manufacturing operations, face extremely volatile operational environments. Finding an appropriate organization is a major, and still unresolved, issue for airline managers. All the approaches from “customer centric organizations” or “virtual process organizations” down to the more classical matrix solutions have not provided answers to date. Punctuality is the ultimate cross-func-

tional problem, and addressing it will help an airline to tackle the organization and leadership challenge.

Clearly defined punctuality targets—integrated in a measurement, control and (ideally) reward system commonly used for cost or revenue tracking—can be applied throughout the organization. Even the marketing and sales department can, and should, be held accountable for poor punctuality performance created by over-selling schedules with connecting times that do not work.

Putting punctuality high up on the agenda helps to unlock the improvement potential for operational excellence hindered by functional boundaries (exhibit 10).



## Punctuality is a Leadership Tool

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By applying some basic principals punctuality can be leveraged as a major leadership tool for cross-functional performance:

- Consistency
- Transparency
- Fair Reward
- Persistency

- Ensure **consistent work policies and procedures** across all functions. There is nothing worse than department A doing one thing and department B doing another, whilst both parties firmly believe they must stick to what they have been told to do.

- Monitor the processes at key milestones to increase the **transparency** of the operations. Include the statistics in the airline's internal communications. Everybody should be aware of the actual situation. "What you measure is what you get."

- **Reward** excellent performance and focus on improving the low performing areas. Using ideas such as internal competitions are good, but airlines must be innovative and constantly find new ways of motivating their staff to "go the extra mile". To pay in cash for improvements is a risky avenue. Airlines such as Continental or Iberia have tried it. Such initiatives may lead the company into a cost increasing vicious circle involving persistent demands for cash payments from staff. Airline employees are proud of their jobs, even though they sometimes claim the opposite. Use the staff's pride and help them to be achievers; helping them be the best in the world on punctuality may be more effective and sustainable than a cash bonus.

- Lastly, **never stop** focusing on punctuality. Improvements will not last unless punctuality is continuously at the top of the management agenda—otherwise it will not be on the staff's agenda.

## Conclusion: Punctuality deserves to rank high on the agenda

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- Punctuality is not only a quality issue—it reduces costs.
- Punctuality differentiates airlines from their competitors.
- Punctuality is a powerful performance indicator that drives total operational excellence. When an airline runs a punctual operation with high service quality, most other indicators are likely to be in the green. Not many industries have such dominant indicators.
- Punctuality is a tool for bridging functional boundaries, which will always be there regardless of any organization model.
- Managing the extended enterprise effectively requires the use of punctuality as a key indicator next to quality and cost in contractual agreements.
- Finally, punctuality is a leadership challenge. It requires all the skills we expect from advanced leaders: Motivate people, create followers, decide on facts, create understanding, drive the wedge!

## Booz·Allen & Hamilton Airline and Aerospace

### Booz·Allen & Hamilton

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### Airline and Aerospace

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**B**ooz·Allen & Hamilton Airline and Aerospace is one of our world-wide competency centers with more than 300 professionals.

Booz·Allen & Hamilton has developed a breadth and depth of experience in the airline industry which we believe is unmatched.

We have completed close to 1,000 successful engagements within the airline, aerospace and travel industry in the past decade, covering all major market segments and geographies.

Our clients include airlines, airports, state aeronautics departments, the Federal Aviation Administration, aircraft manufacturers, third party service providers, aerospace companies, and international aviation authorities. In particular, we have worked with most of the major airlines in the world (7 of the top 15 worldwide and 16 of the 25 largest).

Our services for the airline industry cover the entire value chain, supporting our clients in their successful strategic transformation:

- Strategy development
- Demand and market analysis
- Operational restructuring (of virtually all aspects of airline operations)
- On-time performance improvements
- Alliance management and mergers

- Route and fleet planning
- Marketing, sales and distribution planning
- Organizational development
- Economic and feasibility studies
- Regulatory issues, and civil and military air traffic control
- Airline and travel E-business solutions

### History

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**I**n 1914, Edwin Booz had an idea. He believed that companies would be more successful if they could call on someone outside their own organization for expert, impartial advice. He combined analysis with forward-looking pragmatic solutions. In doing so, he created a new profession—management consulting—and the firm that would bear his name, Booz·Allen & Hamilton.

Today, Booz·Allen & Hamilton is one of the world's largest and most respected management and technology consulting firms. We work with the world's leading corporations, institutions, cultural organizations and governments. We offer to our clients:

- Innovative ideas
- Expertise on a global scale
- Pragmatic, tailor-made solutions
- And above all: results.

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