



Decision Making and Project Management

Lessons from aviation.

2014 SC.GMIS Leadership Summit

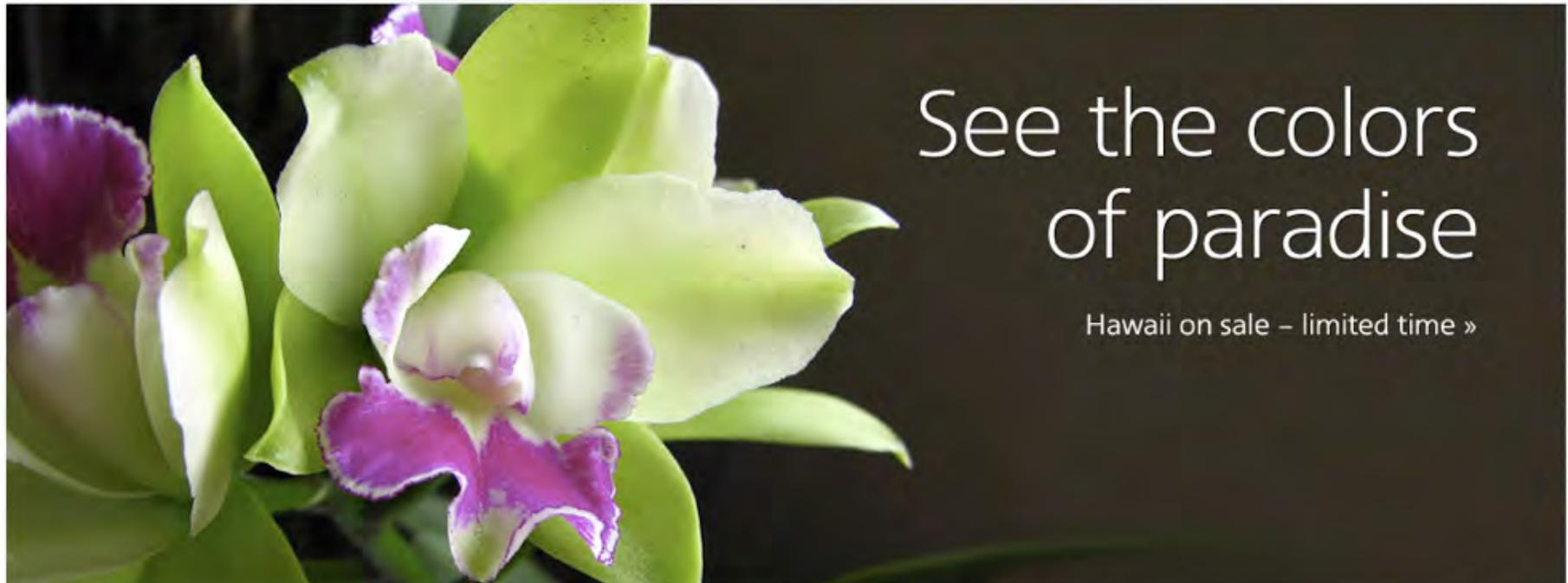
This document contains video references and selected slides from my presentation on 22 April, 2014. Please call upon me if I can be of further service.

Thanks for what you do for South Carolina!

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Resources

- <http://nats.aero/blog/2014/03/europe-24-air-traffic-data-visualisation>
- http://www.ted.com/talks/lennart_green_does_close_up_card_magic
- <https://www.youtube.com/watch?v=zsiGD-e1gAM>
- <https://www.youtube.com/watch?v=1rJtc4ghJlc&feature=youtu.be>
- <http://www.tablegroup.com/oh>
- Rapid Instructional Design by George M. Piskurich. Copyright 2000 by John Wiley & Sons, Inc., San Francisco, CA.



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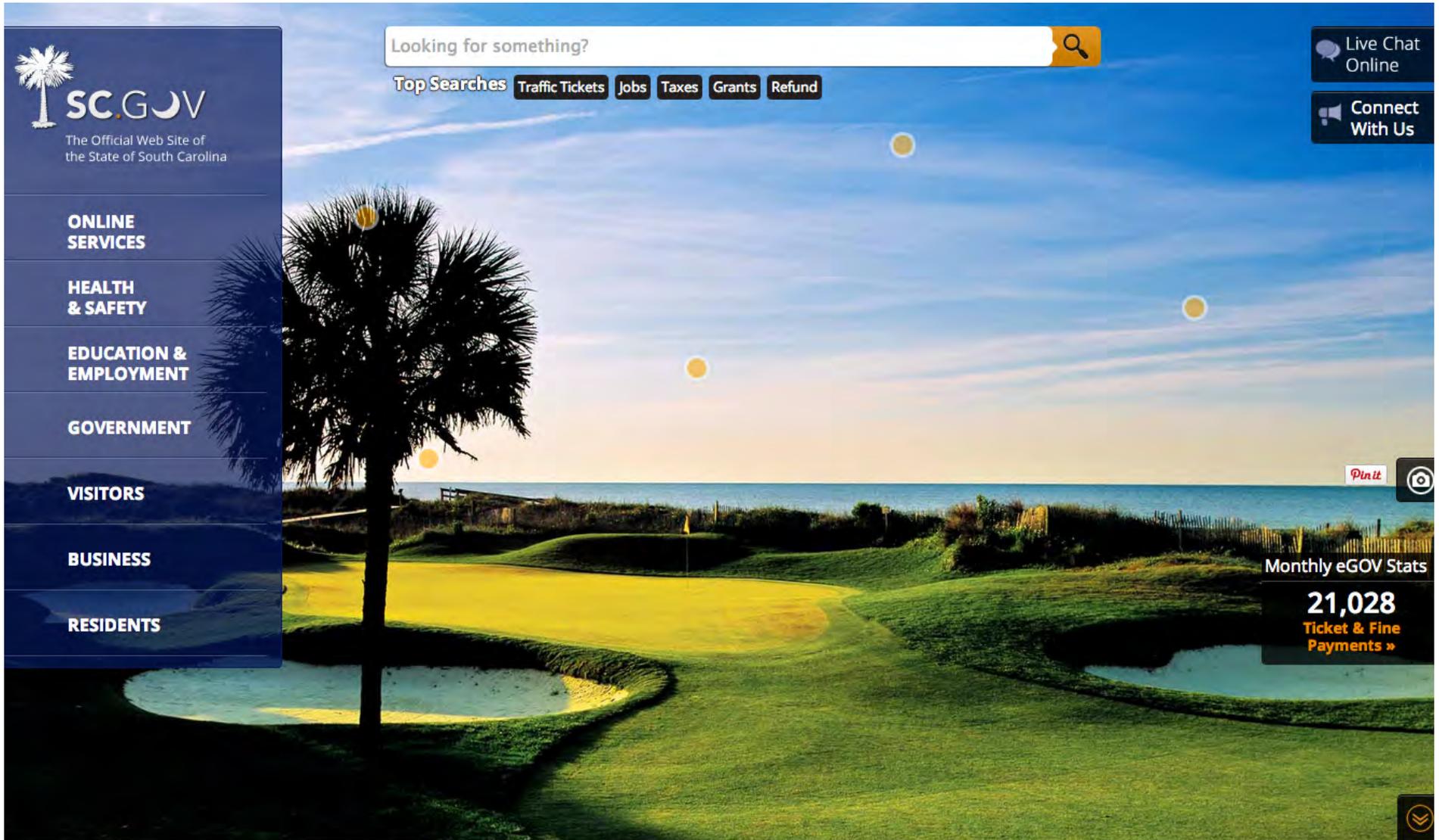
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Decisions Are Everywhere

We just have to see them.



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Decisions Begin With Context

“The decision facing many suppliers will be whether to automate, emigrate, or evaporate.”

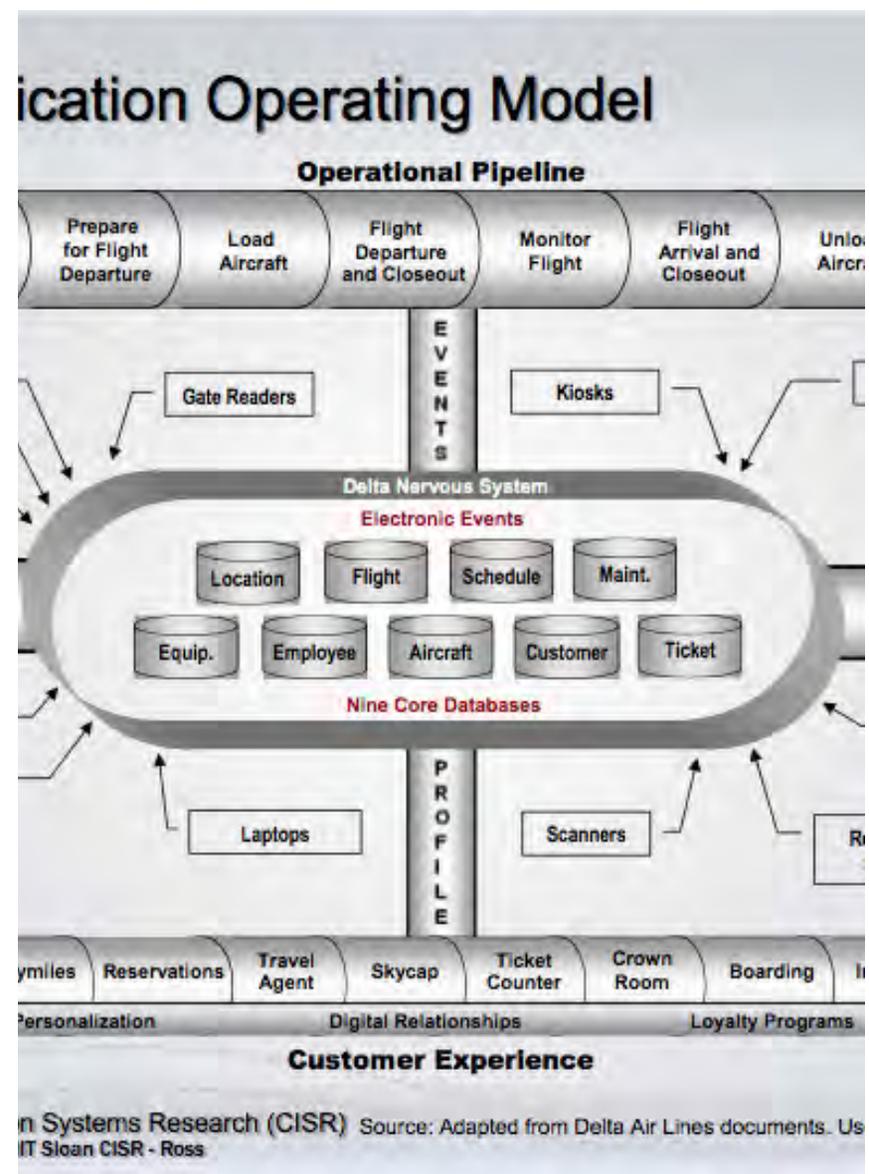
- Aviation Week & Space Technology 2/24/14



U. of the Western Cape

Cape Town, South Africa

What is the real work?

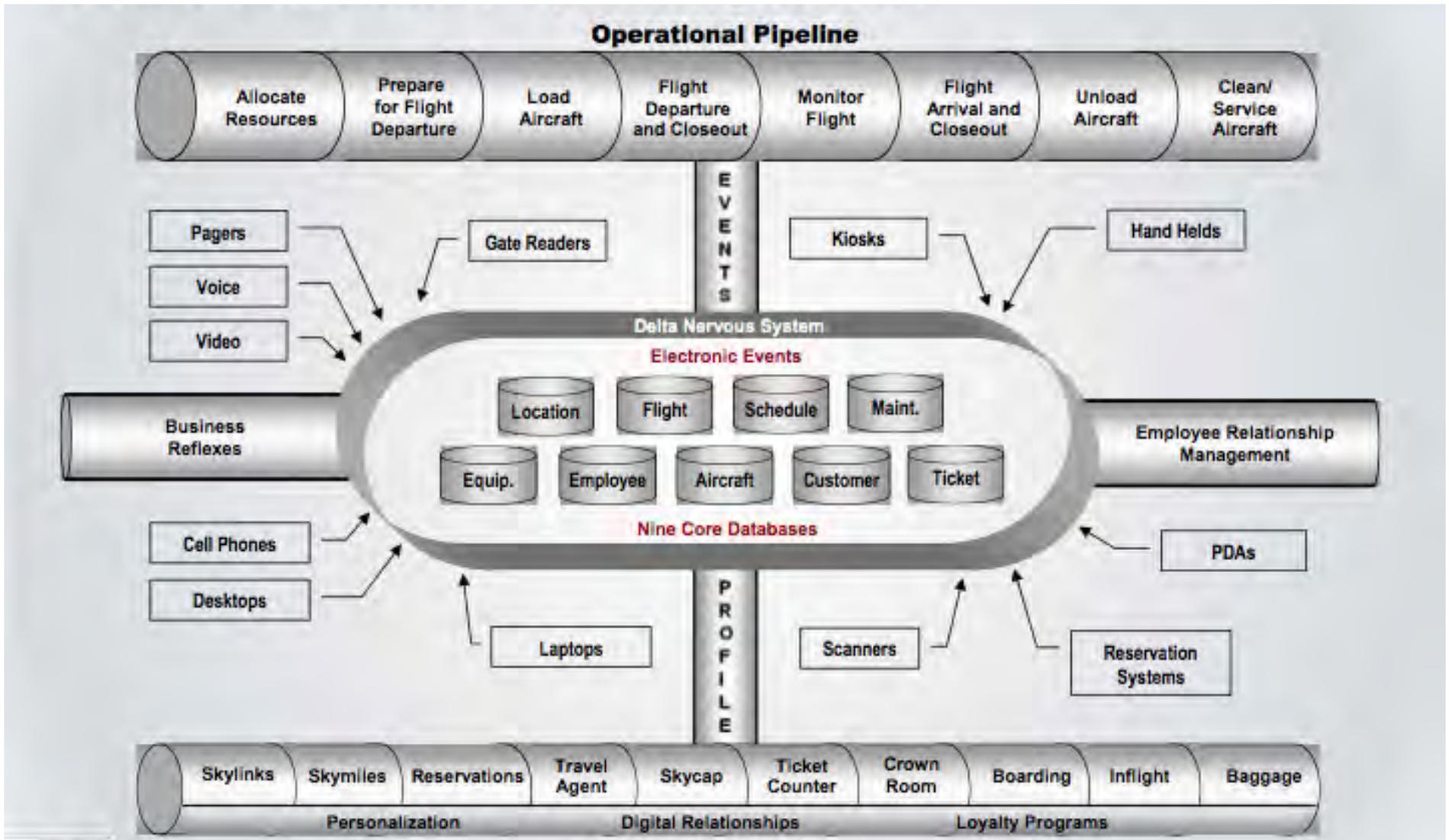


Complicated or Complex?



Is the Work Complicated?

Expertise, detail and constraints



Is The Work Complex?

Center for Information Systems
 Research (CISR) © 2009 MIT Sloan
 CISR - Ross



Complexity on Paper

Requires expertise.



Who Knew?

No one.

Job Analysis Questions

- What do you need to know to do your job well?
- What do you think you do well that a new employee at your job would not?
- What are the most common problems you encounter in your job?
- What changes often on your job?
- What tricks or techniques have you learned that help you do your job better?
- What do you like most and least about your job?
- What makes you most productive on the job?
- What prepared you best to do your job?

Task / Subtask Analysis Questions

- What is the expected output of the task?
- What indicates that the task is done correctly or incorrectly?
- What is the outcome if the task is done incorrectly?
- What do you do if it is done incorrectly?
- How often do you do the task?
- How do you know it is time to do the task?
- What tools and references do you use to do the task?
- What procedures or guidance makes you do the task?

Data Collected During Job / Task Analysis

- Tasks for a given job
- Frequency and difficulty of task performance
- Consequences of inadequate performance
- Conditions under which task is performed
- Cues for task initiation and termination
- Sub-tasks required for task performance
- Tools / equipment utilized in task performance
- Problems that may result in poor task performance

Performance Analysis Questions

- What should employees be doing now that they are not doing?
- What are employees doing now that they should not be doing?
- When employees are working most effectively, what does it look like?
- Do employees know what is expected of them?
- Are employee standards reasonable and achievable?
- Do employees have the proper job aid and tools to work to standards?
- What do your customers want that you are not providing?

Without Those Questions, How Do We Know...

- What our employees and colleagues are doing?
- What tools, data and documentation are necessary?
- How to improve a process?
- How to hire, onboard, train and evaluate employees?
- What good performance looks like?
- Whether the work should be done at all?

Good Decisions Require Self-Knowledge.

Aviation Biases

- Frequency
- Selectivity
- Familiarity
- Conformity
- Group conformity
- Overconfidence



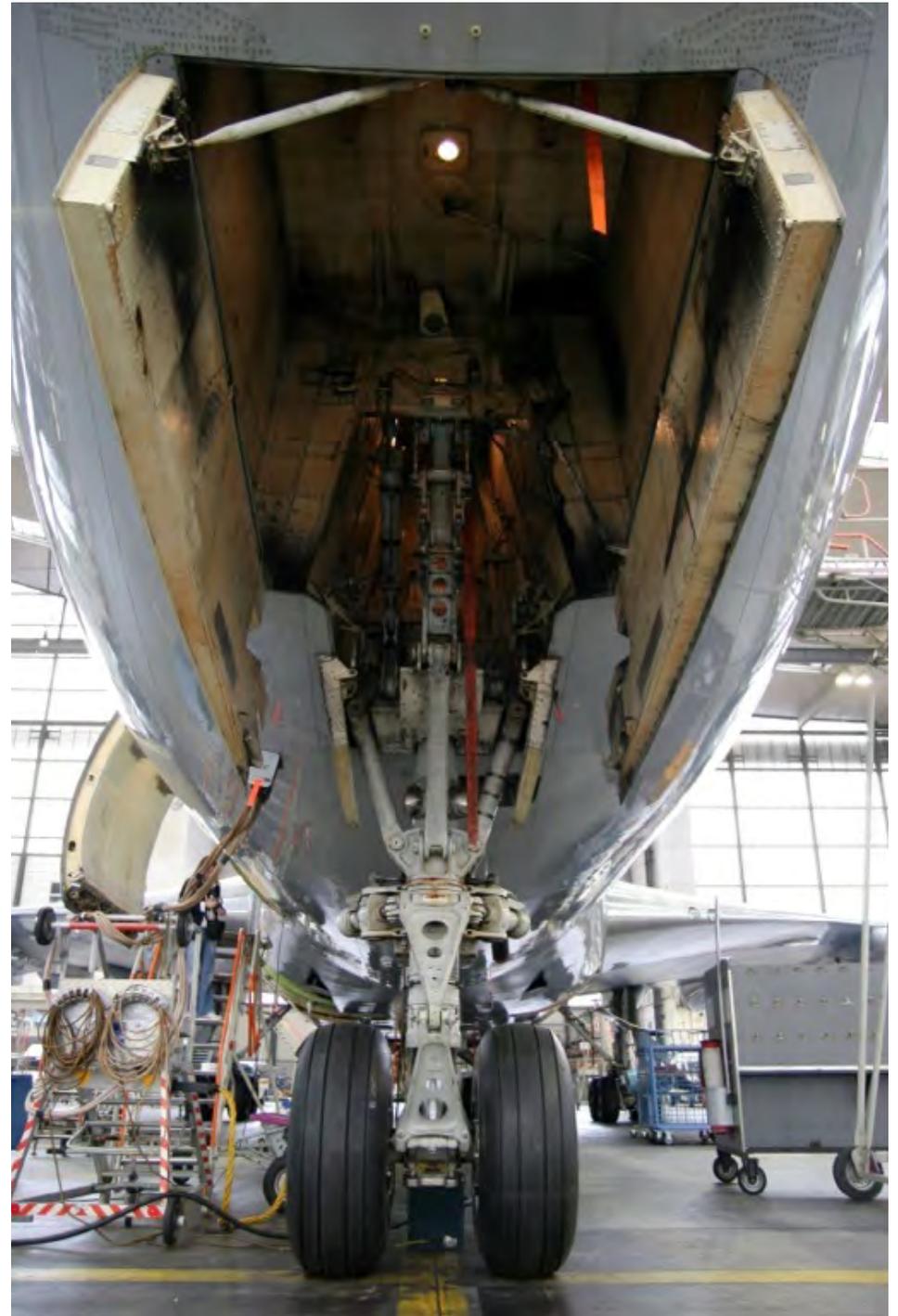
Piloting Errors

- Lapses
- Mistakes
- Violations
- Sabotage
- Latent errors/conditions
- Latent failures
- Active errors



Maintenance Errors

- Lack of communication/
teamwork
- Fatigue/stress
- Complacency/distraction/
awareness
- Lack of teamwork
- Lack of resources
- Lack of knowledge



Crew Resource Management (CRM)

- Teaches communication skills
- Flows communication
- Encourages participation
- Traps errors
- Encourages assertiveness



Crew Resource Management (CRM) Skills

- Communications processes and decision behavior
- Inquiry / advocacy / assertion
- Self critique (decisions and actions)
- Conflict resolution
- Communications and decision-making
- Team building and maintenance
- Leadership / followership and concern for task
- Interpersonal relationships / group climate
- Workload management and situation awareness
- Preparation / planning / vigilance
- Workload distribution / distraction avoidance

Decisions in Relation to Time

- Are we explain our decisions?
- Do we have decision horizons?
- Do we understand the cost of delay?
- Can we deliver time certainty?



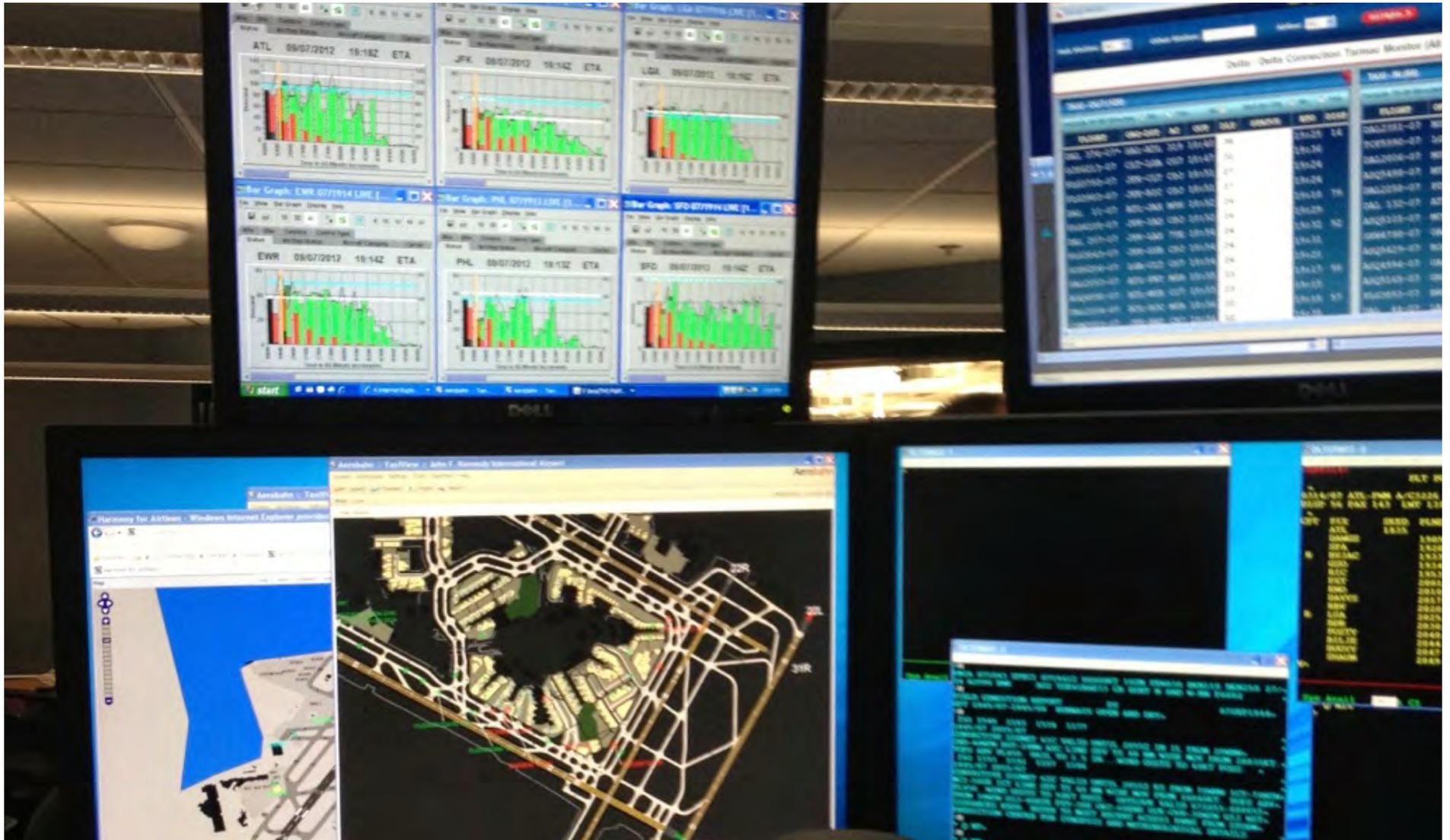


Decision Horizons

Who decides and when?

Decision Support Tools Identify What:

- I may or may not have anticipated
- May be a problem or opportunity
- Must be addressed immediately
- Requires a decision on my (or someone's) part
- Appears to be a pattern
- Is local, organizational or global in nature
- Must happen to start or stop my efforts (including where/when/how)



Can We Explain Decisions?

Even to visitors?



Costs of Delay

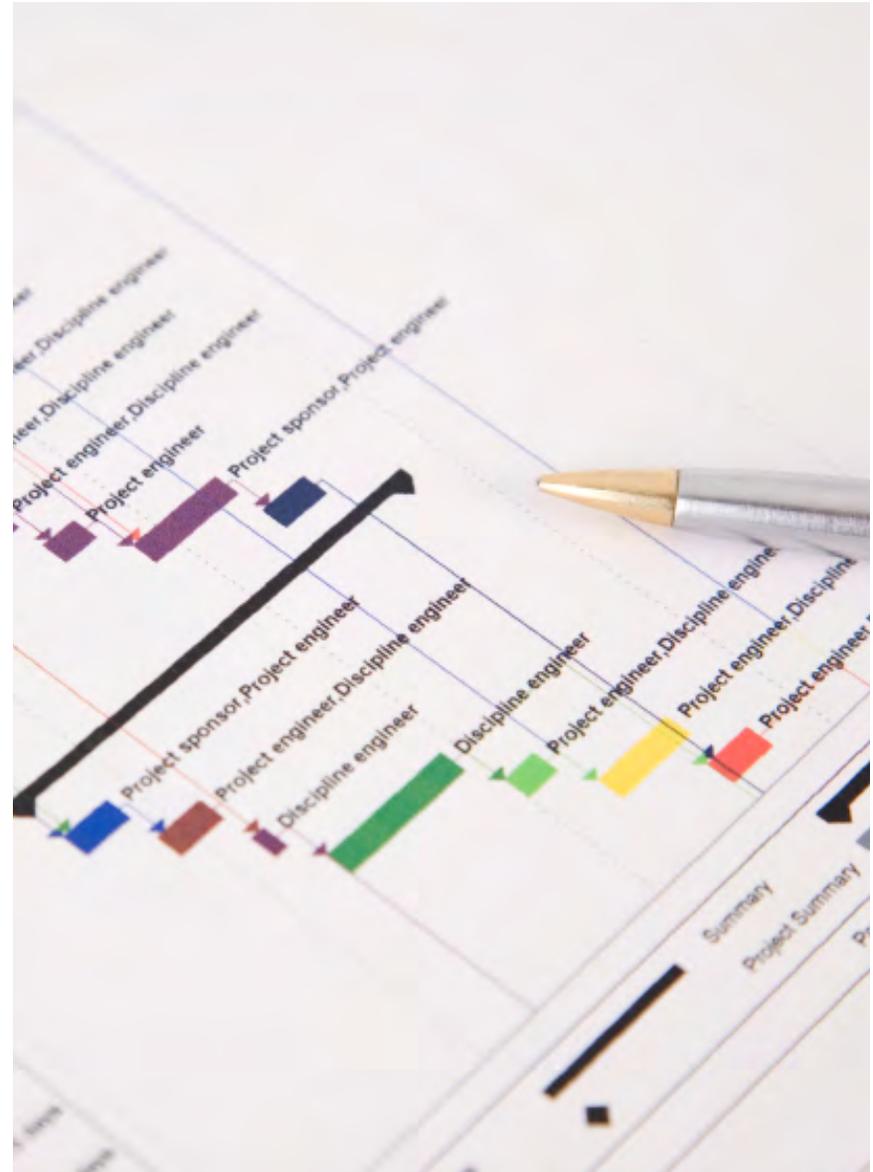
When is the right time to make a decision?

Airline Delay Costs

- Transfer costs to other airlines at origin station
- Transfer costs for missed connections
- Flight interruption costs (general and baggage)
- Fuel
- Maintenance hours - driven
- Maintenance cycle - driven
- ACS overtime
- Pilot overtime
- Flight Attendant overtime
- Crew accommodations
- Ticketing/Frequent Flyer costs



Where does the cost of delay increase in our projects?



Where does cost increase exponentially in our projects?



Prolonged Interim State

The delay that costs the most.

What Are Your Delay Costs?

- Forgone benefits/revenues
- Cost escalations
- Societal costs
- Additional personnel costs
- Additional rental costs
- Increased material costs
- Lost productivity
- Project-specific insurance costs
- Hourly labor rate increases due to longer duration of project
- Demobilization and re-mobilization expenses

“On average airlines will earn about \$4 for every passenger carried - less than the cost of a sandwich in most places.”

- Tony Tyler, CEO of IATA

Big Data. Aviation Got There Early.

Real-Time Performance Metrics

- Aircrew availability by base and usage
- Aircraft spares by fleet type, location and usage
- Taxi-in/out delays by station
- ATC slot management
- Tarmac Delays by station
- Anti-icing/deicing rate by station
- Passenger misconnects by flight and day
- Completion factor performance
- Revenue by flight leg
- Downline revenue disruption by flight leg
- Unaccompanied minors, human remains, cargo management/backlog
- Fuel shortages by station
- Charter and maintenance flights
- TSA delays by airport and terminal

Daily Performance Metrics

- DOT On-Time Arrivals (A:14) performance
- D0 performance
- Completion factor
- Taxi-Out/in delays
- Baggage claims
- Maintenance reliability
- Flights by departure delay code and date
- Diverted/cancelled flights
- Special emphasis flights (e.g., inaugural)
- Station-specific statistics
- Minimum connection times
- Schedule recovery times post IROPS

Airline Performance Metrics

- Alliance performance
- Hub performance
- Fuel consumption
- Required Navigation Performance
- Fleet metrics
- Domestic/international market share
- Delays per 100 flights
- Missed connection per 100 flights
- Minutes/aircraft turn
- Aircraft turns per hour
- Customer satisfaction
- Customer service reports to Department of Homeland Security
- Airline Animal Incident reports



What Isn't Sticking Up?

Sameness tells us something.



Metrics Aren't Math.

Metrics are culture.



Data Drives Behavior

Not breaking things looking for things that are broken.



Big Data

Some things are much bigger.



Obvious Data

Simple works too.



Small Data

Suggests how good you are going to be at big data.



The Other Side of Big Data

Stay away from that side.

Business Decisions

- Does more data lead to more decisions? Better decisions? Indecision?
- Would our project costs would be higher or lower if a decision was delayed?
- Are we only using free or cheap data? Would I consider more expensive data?
- If mobile devices are always providing information and context, is it always the right time to make a decision? Is latency always a bad thing?
- Do our enterprise systems allow our customers and employees all their options or only the options we can most afford?
- Are we making the right decisions but too late and at too high a cost?
- Does today's IT generate more information than a project team can normally process?



Time Certainty

Is what we want, but don't know what to call it.



Departing or Arriving?

Where are our colleagues and citizens in their journey?