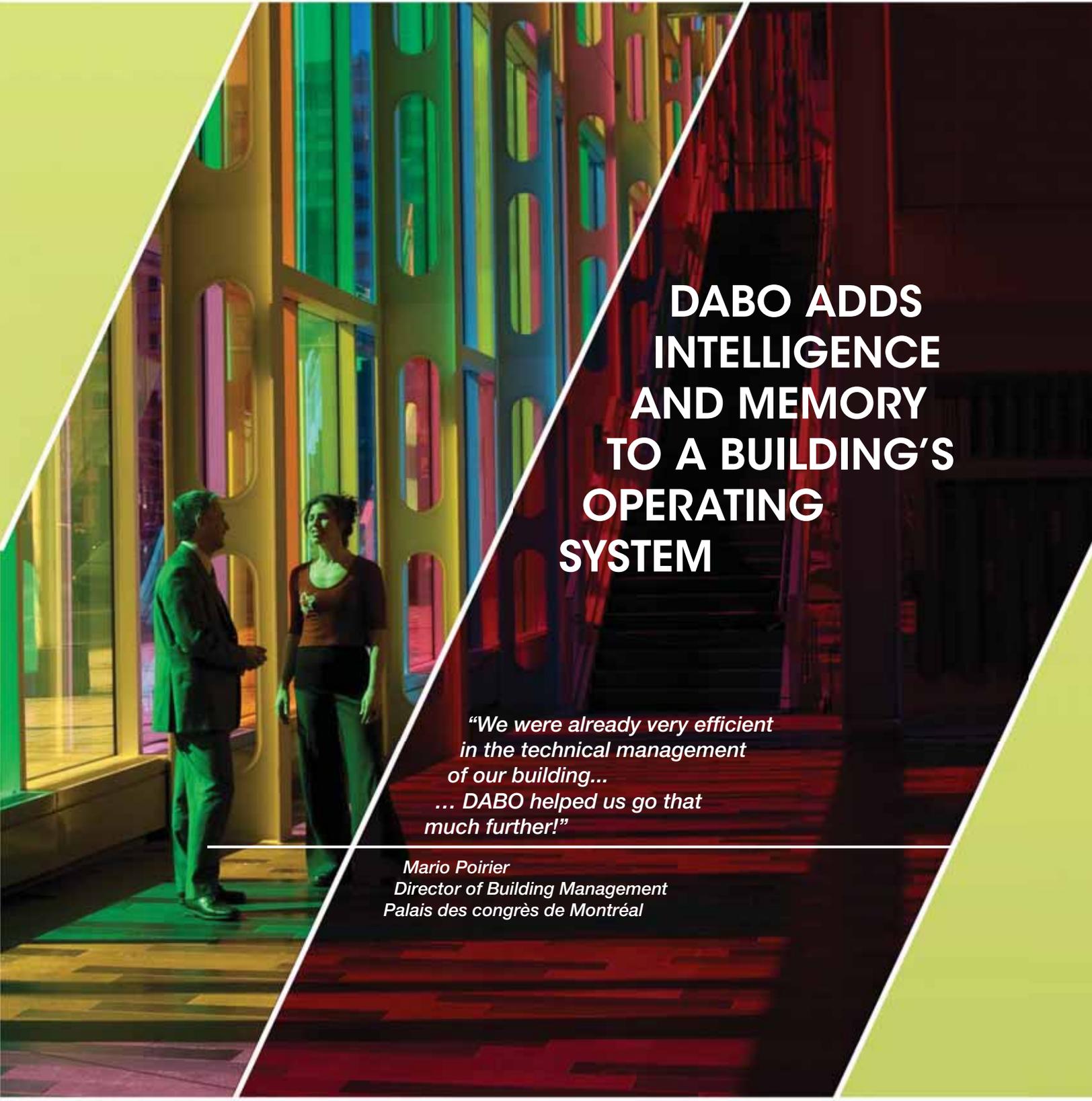




Natural Resources
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DABO ADDS INTELLIGENCE AND MEMORY TO A BUILDING'S OPERATING SYSTEM

*"We were already very efficient
in the technical management
of our building...
... DABO helped us go that
much further!"*

*Mario Poirier
Director of Building Management
Palais des congrès de Montréal*

Canada



A HIGH-PERFORMANCE OPERATIONAL MANAGEMENT TOOL FOR BUILDINGS

DABO USERS INCLUDE:

- facility operation managers
- operators of heating ventilation and air conditioning (HVAC) systems
- heads of corrective maintenance teams
- ongoing commissioning professionals

DABO IS:

- a **database** designed to collect all of the information received by the central building automation system. In addition to climate conditions and energy consumption, it retrieves data collected by sensors and other components of the electromechanical system such as the temperature, air flow rate, static pressure, position of dampers, and the performance of service equipment.
- **800 expert rules** for consistency analysis, efficiency assessment and good operating practices
- **275 performance indices** to help identify non-optimal operation and under- or over-designed components

HOW DABO WORKS:

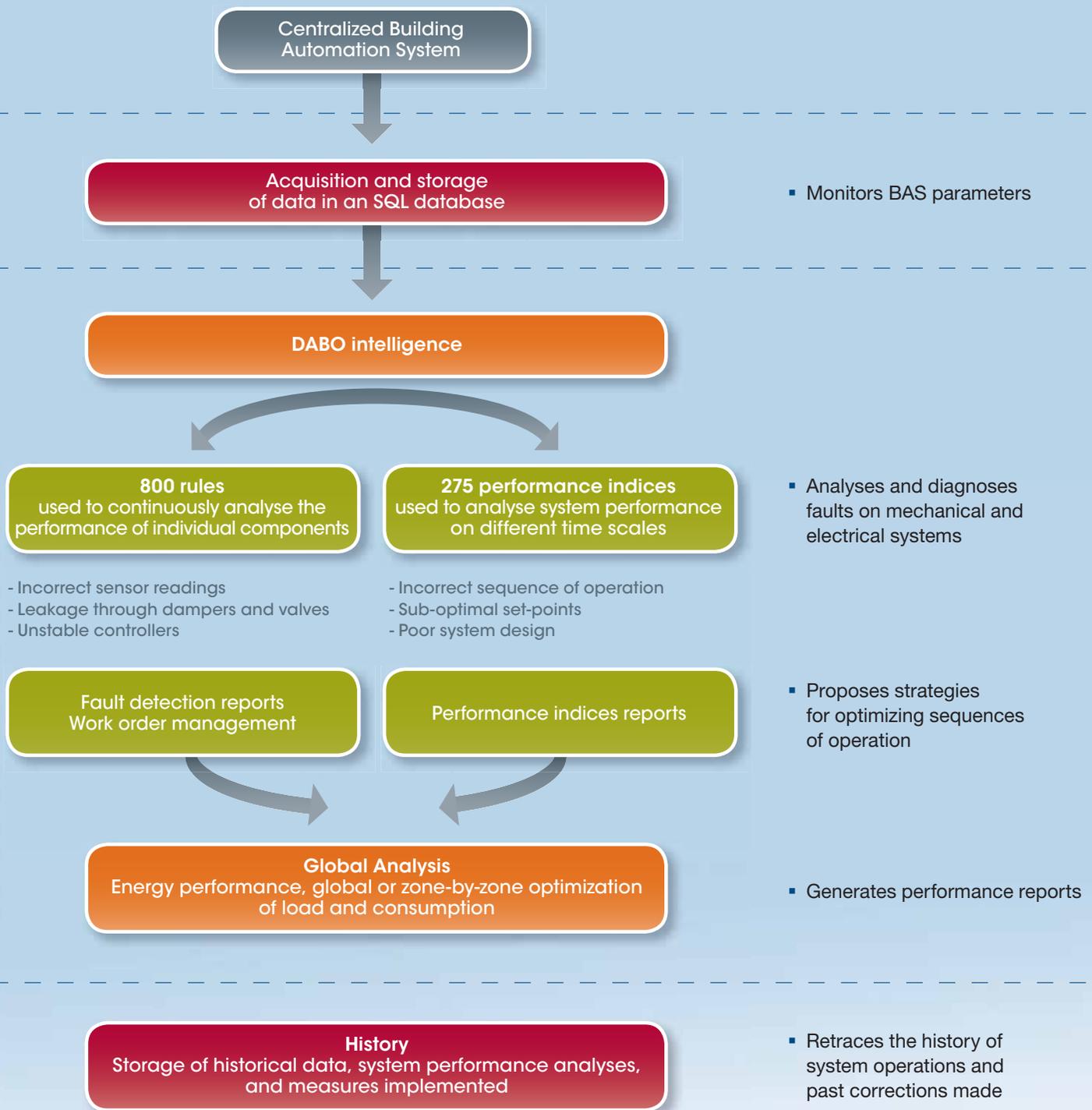
- every 10 minutes, DABO interfaces with the central building automation system to record the values for all the electromechanical system's components and stores the data in its database
- every hour, DABO analyzes the information in the database, applies its expert rules, detects abnormal component behaviour and identifies operational anomalies
- at the user's request (in general, every two to four weeks), DABO applies performance indices to conduct a more detailed analysis
- at the user's request (generally once a day when the operator arrives at work), DABO produces fault detection and performance analysis reports. In addition to these diagnoses, DABO suggests corrective measures that could be taken by the maintenance team before the faults affect the system performance



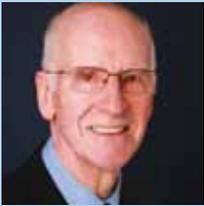
ADVANTAGES OF USING DABO INCLUDE:

- increased user comfort and reduction in the number of complaints and service calls
- real-time identification of corrective actions to take and efficient scheduling of corrective maintenance team tasks
- all traceability elements required to implement a quality assurance policy (ISO)
- optimal design of a component or system to be replaced, thanks to the operational and performance history
- lasting energy savings, with initial savings of more than 15%
- ongoing commissioning
- ease in obtaining LEED certification!

THANKS TO THE DABO DATABASE, BUILDING MANAGERS NOW HAVE A COMPLETE HISTORY OF THE BUILDING'S OPERATION



SUSTAINING OUR FUTURE BY REBUILDING OUR PAST



Gordon V.R.
Holness, P.E.
2009 - 2010
ASHRAE President

A key element to remember is that in the life cycle of a building, initial construction cost is only 2%, and operational and energy costs are only 6%. The major cost is that of the building occupants, and they represent over 92% of life-cycle cost. If you can improve the health, well-being and productivity of the building occupants by providing an efficient and sustainable environment, you can more than pay for the initial building costs.

(...)

While we can build the seemingly most efficient buildings, that means nothing if we cannot keep them operating efficiently. We need to learn why building performances typically deteriorate as much as 30% in the first three to four years of operation and the role that commissioning and retrocommissioning can play to reduce that performance decay. We do know that commissioning is a quality focused process that if implemented early in the design can save time and money and improve the quality of the end product: a healthy and productive building.

According to studies, retrocommissioning of existing buildings can save 10% to 40% simply by improving operational strategies. Certainly, we know that the 20 to 50 cent per square foot cost can be returned in less than one year through energy savings of at least 15%, according to the Building Commissioning Association (www.bcxa.org).

In "Sustaining Our Future By Rebuilding Our Past" by Gordon V.R. Holness, P.E., Fellow/Life Member ASHRAE in August 2009 issue of the ASHRAE Journal. Copyright 2009 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

"Our team has a firm grasp of the notion of continuous optimization, but DABO gives us the means to achieve our objectives far more efficiently."

We had taken steps to improve our energy efficiency before installing DABO. We were very proud of achieving energy savings of nearly 20% thanks to our efforts. Amazingly enough, since we have been using DABO, we have further decreased our annual energy costs by \$150,000!"

*Mario Poirier, Director of Building Management
Palais des congrès de Montréal*

CONTINUOUS BUILDING OPTIMIZATION: A CLEAR, INNOVATIVE OPERATING APPROACH

Installing new generation, high-efficiency equipment has significant advantages. But experts, as ASHRAE, agree that the largest energy losses are the result of non-optimal operation of electromechanical systems. To avoid or correct this problem, you need a policy based on two steps: "recommissioning" and "ongoing commissioning."

"Recommissioning" (updating each component of an electromechanical system and revising operating procedures) is something you can do immediately. When the installer sets up the database and reviews all of the electromechanical system's components, proceeding with "recommissioning" is a wise course of action. DABO has all of the specialized functions required to recommission your building.

Once your systems have been updated and are operating in a logical, productive manner, you want to maintain this optimal performance. "Ongoing commissioning" is carried out by DABO's fault detection, diagnosis and performance monitoring functions.

DABO'S ADVANTAGE OVER OTHER SOFTWARE AND WEB SOLUTIONS IS ITS CUTTING-EDGE TECHNOLOGY

DABO is a continuous optimization tool based on the principles of fault detection, performance analysis and compilation of a documented history. This work method enables DABO to identify problems in real-time and suggest solutions that can be implemented immediately.

Other tools:

Energy consumption monitoring software flags abnormal consumption but provides no indication as to the source of the problem (was it a change in building activities? an operational anomaly? inefficiency of a piece of equipment? an issue with the calibration of a sensor? ...).

Energy cost monitoring software has the same shortcomings as consumption analysis software, in addition to taking several weeks to produce the information.

As for ongoing commissioning web services, they all have the same problem, which is that they have exclusive ownership of the information collected in the building. The client has no leeway and must pay for additional analyses. If the subscription to the service is not renewed, the compiled history is permanently lost.

DABO therefore has the edge over other technological tools that provide building operation assistance. It is based on 10 years of research and development in Canada and on collaboration with a team of international experts. DABO is ahead of the technology curve of other solutions on the market by several years. It therefore gives users a significant competitive advantage.

WHAT STAGE ARE YOU AT?



DABO helps you anticipate problems before they affect the system so you can avoid alarms and complaints.

TYPES OF ANALYSIS TOOLS	FUNCTIONS
Benchmarking and labelling	Global analysis of the building's performance by comparing it with a similar building (only after 6 to 12 months).
Energy cost analysis	Proposes optimal cost and identifies discrepancies compared to previous years.
Trend analysis	Produces only partial analyses. Does not identify specific causes or corrective measures.
Meter reading – Energy consumption monitoring	Detects anomalies in real time. Provides a global analysis. Does not identify causes.
Fault detection and performance analysis	Detects anomalies, conflicting operating strategies, abnormal component behaviour. Performs in-depth analysis of performance – Provides diagnoses and suggests corrective measures. Compiles a documented history – Conducts ongoing commissioning (continuous real-time monitoring) – Helps users obtain LEED points.

DABO CONTINUOUSLY ANALYZES AND STORES ALL DATA RECEIVED BY YOUR CENTRAL CONTROL SYSTEM

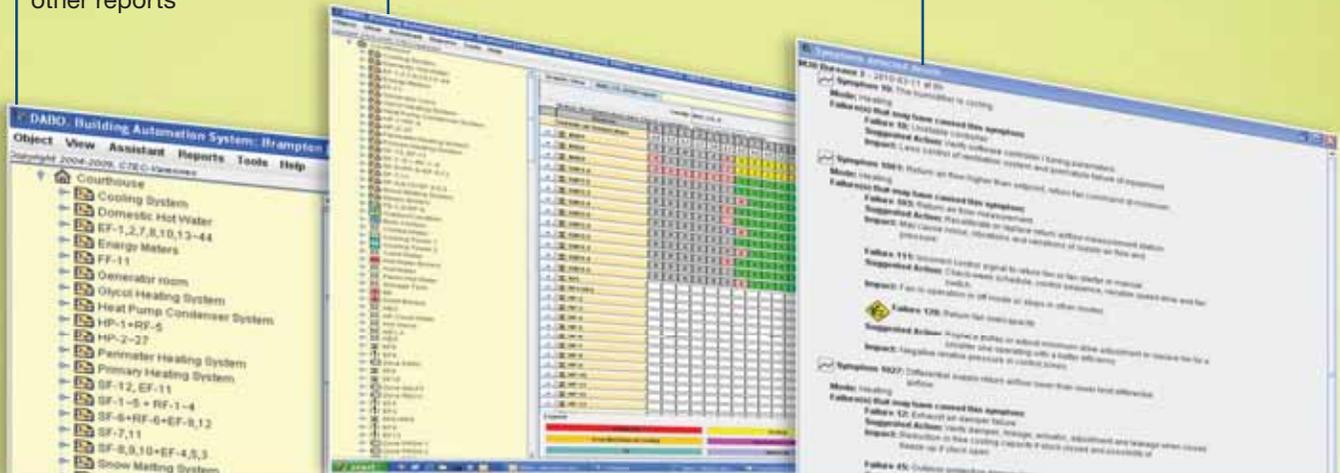
- ensures constant monitoring (24/7) of the operation of the building's electromechanical systems
- performs real-time fault detection, abnormal component behaviour and operational anomalies
- produces diagnostic reports, suggests corrective measures and issues work orders
- anticipates problems and minimizes occupant complaints
- allows optimization of system performance, generating substantial energy savings
- enables efficient scheduling of corrective maintenance team interventions
- generates a report detailing the history of the electromechanical system's operation, its faults and the corrective measures implemented
- is an essential tool for managing operational documentation, indispensable for a quality assurance policy (ISO)
- ensures continuous operational efficiency, crucial for ongoing commissioning
- contributes to obtaining LEED certification
- has been tested in large buildings

DABO PRODUCES FAULT DETECTION REPORTS AND DIAGNOSES AND SUGGESTS CORRECTIVE MEASURES

Direct access from the main screen to the fault detection and other reports

Overview of faults detected throughout the day on each system

Diagnosis: Probable causes and suggested solutions for a detected fault



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