

# **ANSP Data Warehouse**

## **What is a Data Warehouse?**

A data warehouse is a system that pulls together data from many different sources for reporting and analysis. In more comprehensive terms, a data warehouse is a consolidated view of either a physical or logical data repository collected from various systems. A data warehouse is designed to give a long-range view of data over time. It trades off transaction volume and instead specializes in data aggregation. A data warehouse is mainly an architecture in contrary to big data which is a technology based on volume, velocity, and the variety of data.

## **Why does an ANSP need a Data Warehouse?**

Again, and again decision makers and users in ANSPs ask us the following question: «Why do I need a data warehouse? They argue that it is easier to prepare the data in Excel or in the appropriate application; it is far too laborious to use such data prepared from a data repository». Yes, it is evident that you don't establish a centralized aeronautical data repository as an end in itself. But you can look at it in a different way. A data repository with quality assured data and information is the base to provide for many different analytical and operational functions in an ANSP. A nice chart is not useful if it is based on wrong data. ATM users don't see the data in their applications, charts, dashboards or operational environments. The data behind analytical or operational functions in an ANSP is an abstract puzzle piece of a complex business intelligence architecture. So, why should an ANSP nevertheless care how its data and information is collected, processed and made available? Here are three reasons:

### **1. Data driven ATM operations:**

In today's aviation environment, ANSPs strive to enhance their decision-making activities in order to improve business processes and achieve an agreed level of safety. Although ANSPs collect and store a large amount of information every day, this data comes from multiple disparate sources, thus making it difficult to aggregate and review. Yet to be efficient in today's highly competitive environment ATM users need ready access to timely and complex analysis on an aggregated view of quality assured data. In recent years advances in technology and business processes, improved data management, increased in information availability, and decreased storage costs have facilitated the development of data warehousing, which can support ANSPs to efficiently utilize their data. Data warehousing is the process of centralized data management and retrieval. It helps transform vast amount of required data into useful and reliable information that ANSPs can leverage to help them remain efficient and achieve the required level of safety in their ATM operations. A data warehouse not only provides the foundation for powerful data analysis techniques such as data mining, but it also provides ATM users with the relevant data and information they need for informed decisions.

### **2. Cost Reduction**

Yes, a data warehouse project is not cheap. But if all required data is modelled intelligently, it forms the base, to support all analytical and operational functions performed in an ANSP. The ATCO for example, can take informed decisions based on quality assured aeronautical data available from the data originator without reintegration of the source in his ATC

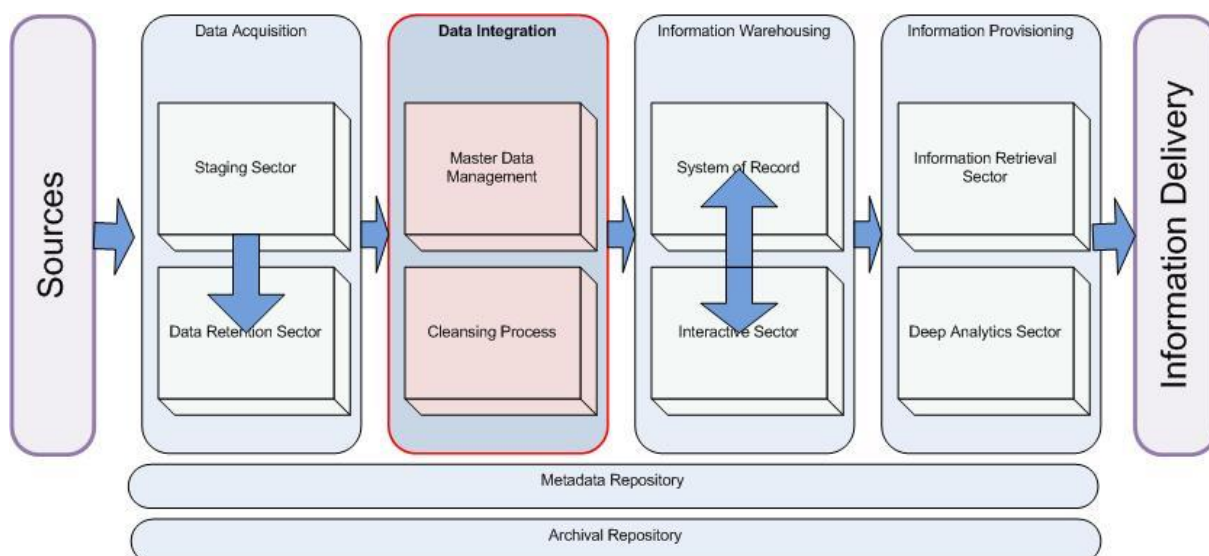
application. Or, a safety department can also utilize such a data warehouse with appropriate tools to analyze safety data and perform an internal safety analysis. A data warehouse enables an ANSP to ensure that all required data coming from a multitude of sources is centralized in a core data repository. Such a data warehouse uses consistent and repeatable processes for loading operational data that support day-to-day ATM operations into support databases. Additionally, such a data warehouse translates heterogeneous information into common models, names, and definitions and provides a means to make information available for operational decision making. Moreover, a data warehouse presents the information according to specific subjects, integrates data from multiple sources, and displays it in one form. It also stores historical data that remains consistent regardless of the time it is accessed; the data kept in the warehouse will not change. Finally, the architecture is open and scalable and built in such ways that it can support the future expansion of data. ANSPs collect and store large amount of heterogeneous data from a wide variety of sources and it is critical that they strategically leverage technology to access, analyse, and use their data in order to enhance their decision-making activities and improve their business processes. Various case studies show that, while the investment to a data warehouse can be significant, the quantifiable benefits it offers can be much larger, than organizing the data supply in a redundant manner for every major application.

### **3. Networking of knowledge**

One of the big advantages of data warehouse in an ANSP environment is the possibility to integrate and interconnect data and information from different sources. An ANSP using a data warehouse creates the base to generate knowledge allowing to take better informed decisions. ANSPs are only starting to exploit the potential based on the integration of data and information and the networking of knowledge as they begin to understand that the ANS business is becoming data and information driven business. The airline industry understood this much earlier and therefore started utilizing heterogeneous data and information from a wide variety of sources to be more effective. In airline environment where competition is constantly increasing, airlines have understood that it is critical that they strategically leverage technology to access, analyze, and use their data in order to enhance their decision-making activities and improve their business processes. ANSPs need to understand that not only the airline business is data driven but also their ATM business will be completely data driven in future.

### **How does an ANSP achieve data integration in a data warehouse?**

Here a simplified model how data integration is achieved in an ANSP:



ANSPs are constantly looking to enhance their decision-making activities in order to improve their business processes and be more effective. Designed for query and analysis rather than transaction processing, a data warehouse is a database that centralizes the data coming from multiple sources. It translates information into common models, names, and definitions while also providing a mean to make information available for improved decision making.