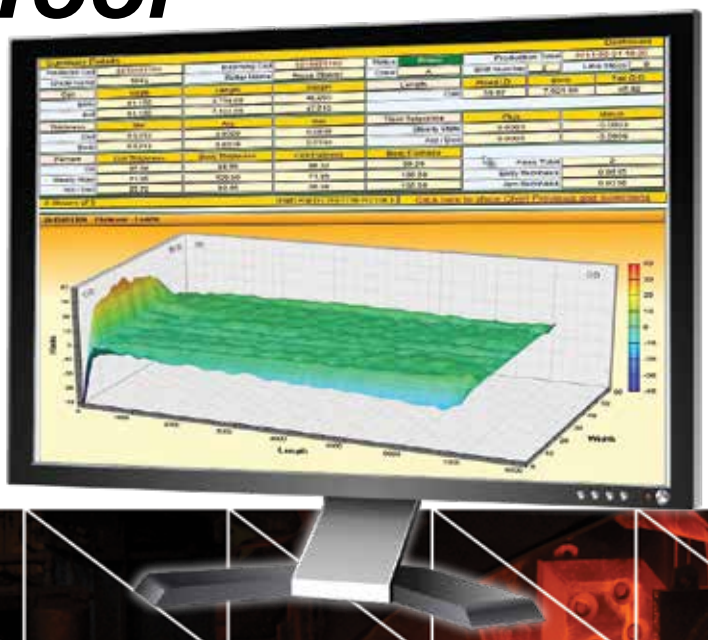
TMEIC
We drive industry

Unified Tool – *uTool*®

Access to Everything



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Introduction - The Manufacturing Control System

Most steel mills employ a manufacturing control system (MCS) to handle all the major production functions. This distributed control system is connected to the measuring and actuating devices on the machinery, such as variable frequency drives, motors, tachometers, limit switches, solenoid valves, and high accuracy thickness gages.

Mill data can be extracted from the many controllers (PLCs) which control the machines, but software is required to gather and create usable information. Many different software tools have been developed to extract information; some of the tools and their complexity and difficulties are illustrated in Figure 1.

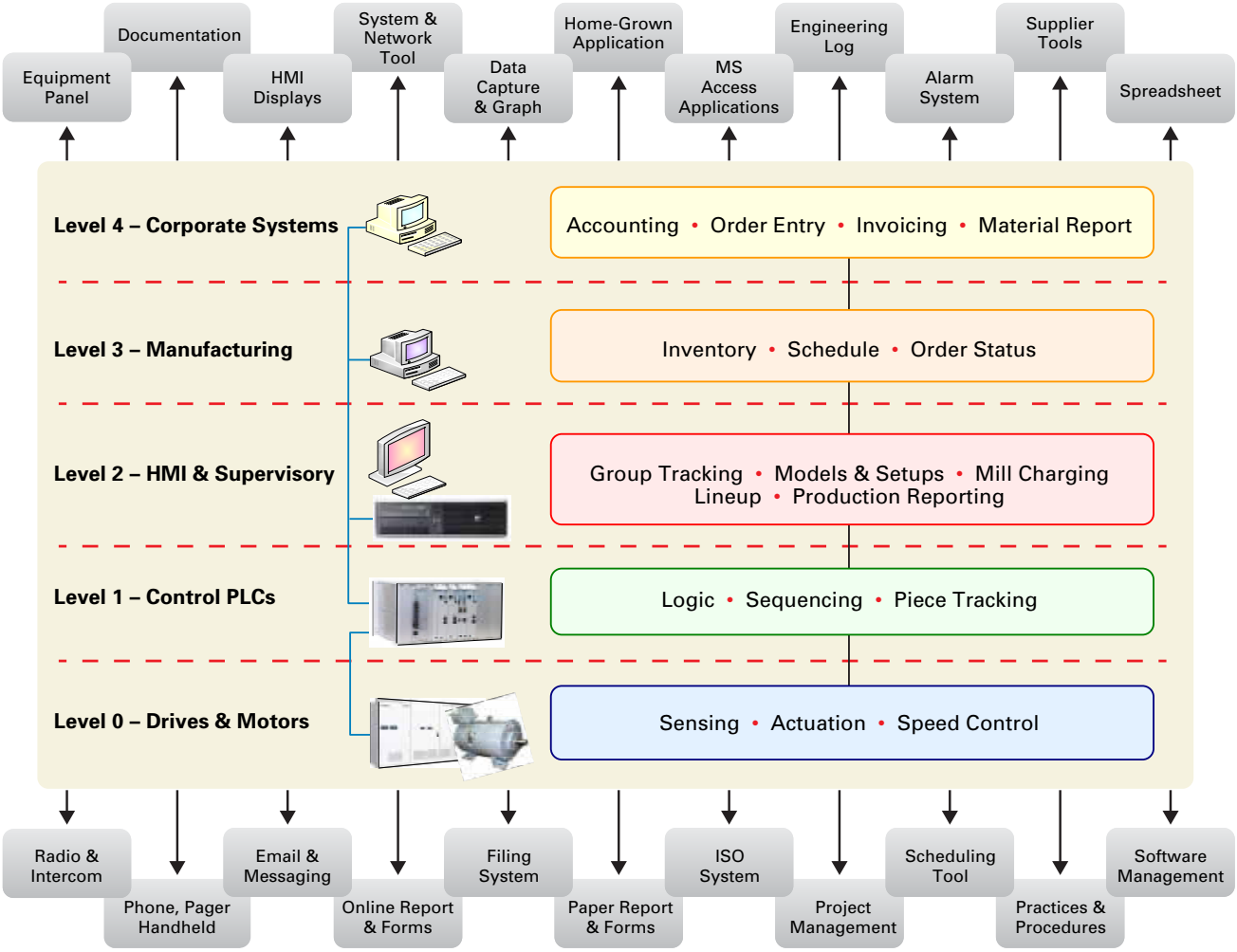


Figure 1 – Complexities of Extracting and Delivering Plant Information from a Manufacturing Control System

A Simpler Way

A simpler way to extract and present plant information, available to all users, is needed and will save time and money, and allow creative plant improvements to be made to keep the company competitive.

TMEIC has developed the uTool system for industrial customers to simplify the gathering and access to this plant data, using the plant network and Web-based tools.

uTool – A Unifying Approach

uTool enhances productivity, offering connectivity to key mill information and diagnostic power through easy to use Web-based technology. It offers an integrated view of product, process and system information to deliver the right information at the right time to the right persons – the maintenance, supervisory, and executive staff.

uTool System Features	Benefits
Web-based System	*Tools widely available with Web browser (Internet Explorer); access to tools and information over the plant network*
Security	*Privilege-based access to information as well as full access for system experts*
Near real-time Information	*Faster problem detection*
Deep and Wide	*Drill down to low level, detailed information throughout the automation system*
Multi-lingual	*Menus and text can be switched to alternate language*
Document linkage	*Fast access to documents such as manuals, company standards, FAQs (xls, doc, ppt, pdf, text)*
Configurable with Common Web Programming Language	*Meet new demand as needed*
Decoupled for Automation System	*Added value without affecting system reliability*

System Advantages

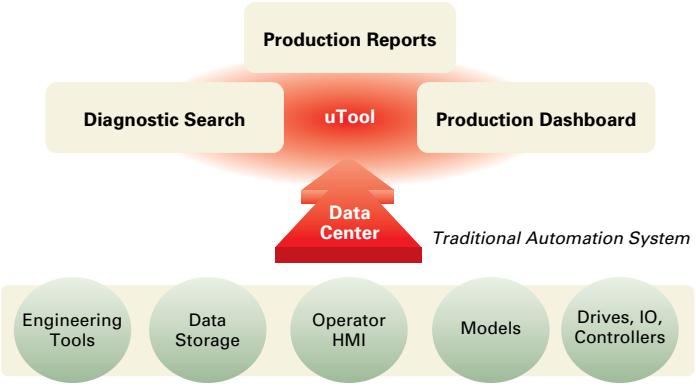


Figure 2 – uTool Overview

Remote Apps – Remote access to a broad range of software tools on multiple work stations, without installing programs on the client computer by employing Microsoft Remote Apps.

Web Programming Software – uTool can be customized using PHP, a common Web programming language

Display Key Data – Hourly and Shift production data is presented in graphical bar chart and numerical form:

- coils per hour and coils per shift
- tons per hour and per shift
- details of coil quality such as strip thickness in 3-D color
- strip thickness and width deviations

Production Dash Boards – Concise graphical view of the mill status in near to real time using bar charts, gages, color lights, etch, refreshed automatically.
Data such as Steel Grades today, Hourly Tons, Mill Status, Tons this day, Coils this day, and etc.

Search Function – The database is searchable. High resolution data is stored for 30 days, then is gathered and placed in long term database storage. The system provides "Total Coverage" of data collection and storage.

The uTool Presentation Layer

Web server technology, coupled with data center techniques, can deliver timely, relevant data to the client browser as actionable information. This is a system of easy access to everything using the power of the Web to tie it all together.

Figure 3 compresses the manufacturing control system across the bottom of the page and links it to the new data storage layer called the Data Center, which is the source for the presentation layer.

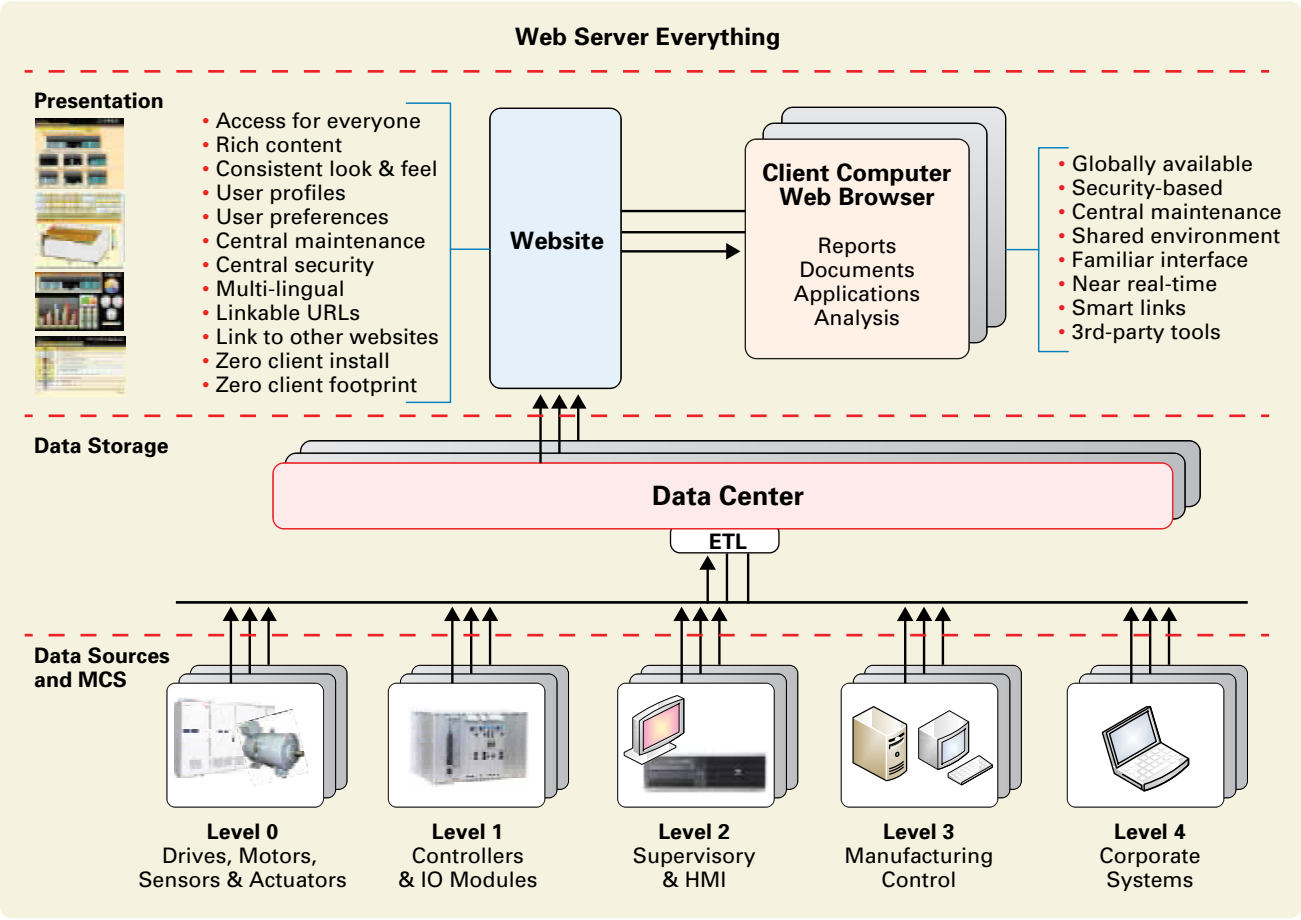


Figure 3 – uWeb, the Web-based Presentation Layer, supported by the Data Center

The presentation layer offers many user benefits, including the following:

Efficiency – Open access to plant data is provided through the familiar, easy to use Web browser. No installation or training is required, and all users see the same information in the same way, at the same time.

Workflow – Website techniques allow users to save and share data by downloading results direct to their computers.

Environment – Modern Web programming languages and environments are well-developed, with many excellent open-source products available for free. The Web can be used to deliver rich content in the form of tables, graphics, and video.

Maintenance – Program maintenance is preformed on a central server with backup, test and development environments easily configured and maintained. Clients do not need to upgrade software to access new or upgraded Web content.

Securing – A user security system can be built into the Website to track and control access to sensitive data and applications; a single, site-wide sign-on can allow access to restricted content.

Training – If training is required, learning is speeded by providing online documents, procedures, and best practices.

Translations – Language software can instantly convert Web content, controls, and tips, to any language.

The Data Storage Layer

The various types of electronic data are collected from the MCS using a database industry concept called Extract, Transform and Load, or ETL for short. This is illustrated in Figure 4.

The main advantage of using ETL is the mill's MCS model remains unchanged, and the Web and Data Storage layers can be implemented gradually, thus reducing risk.

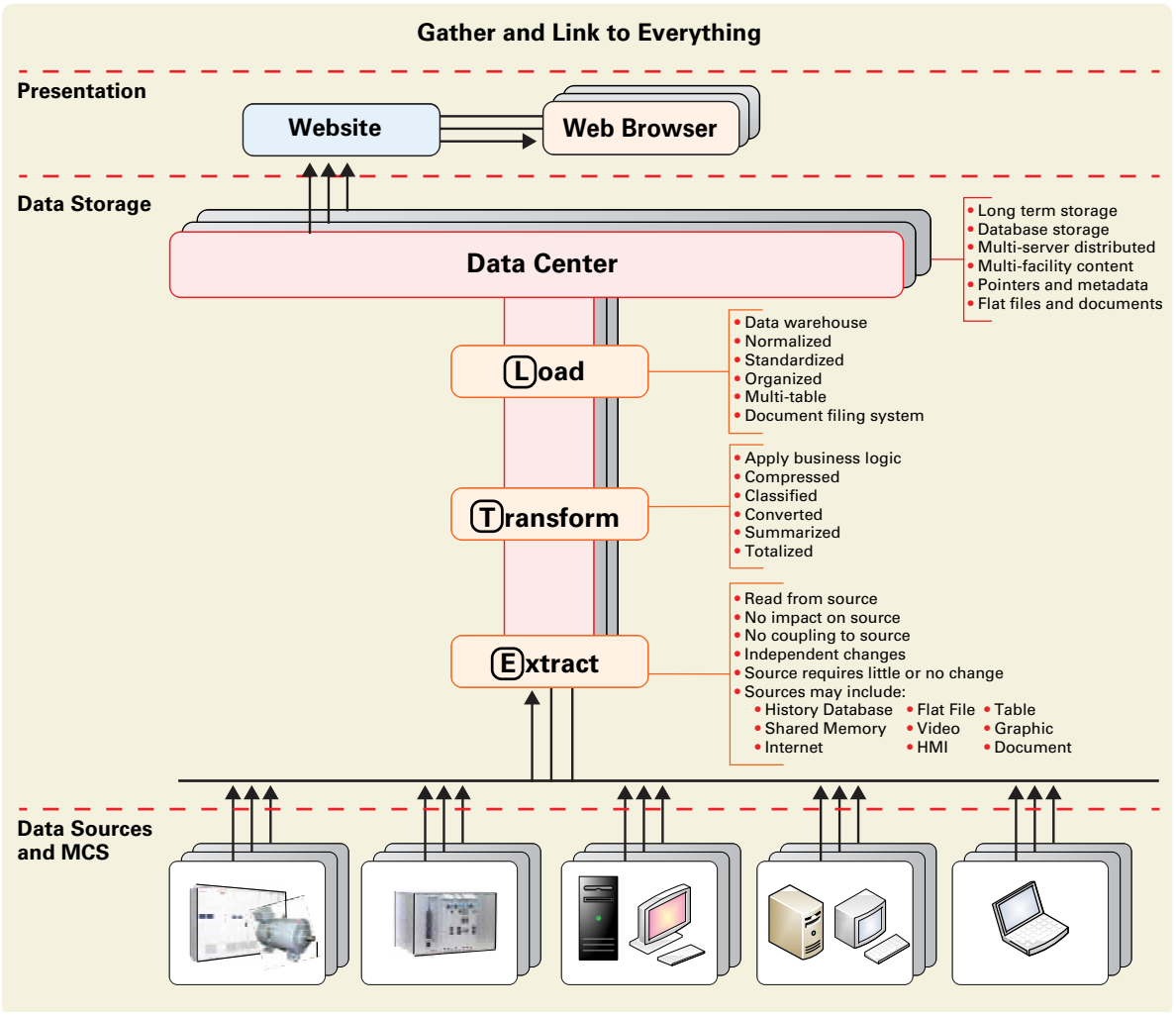


Figure 4 – The Data Storage layer showing the Extraction, Transform, and Load functions.

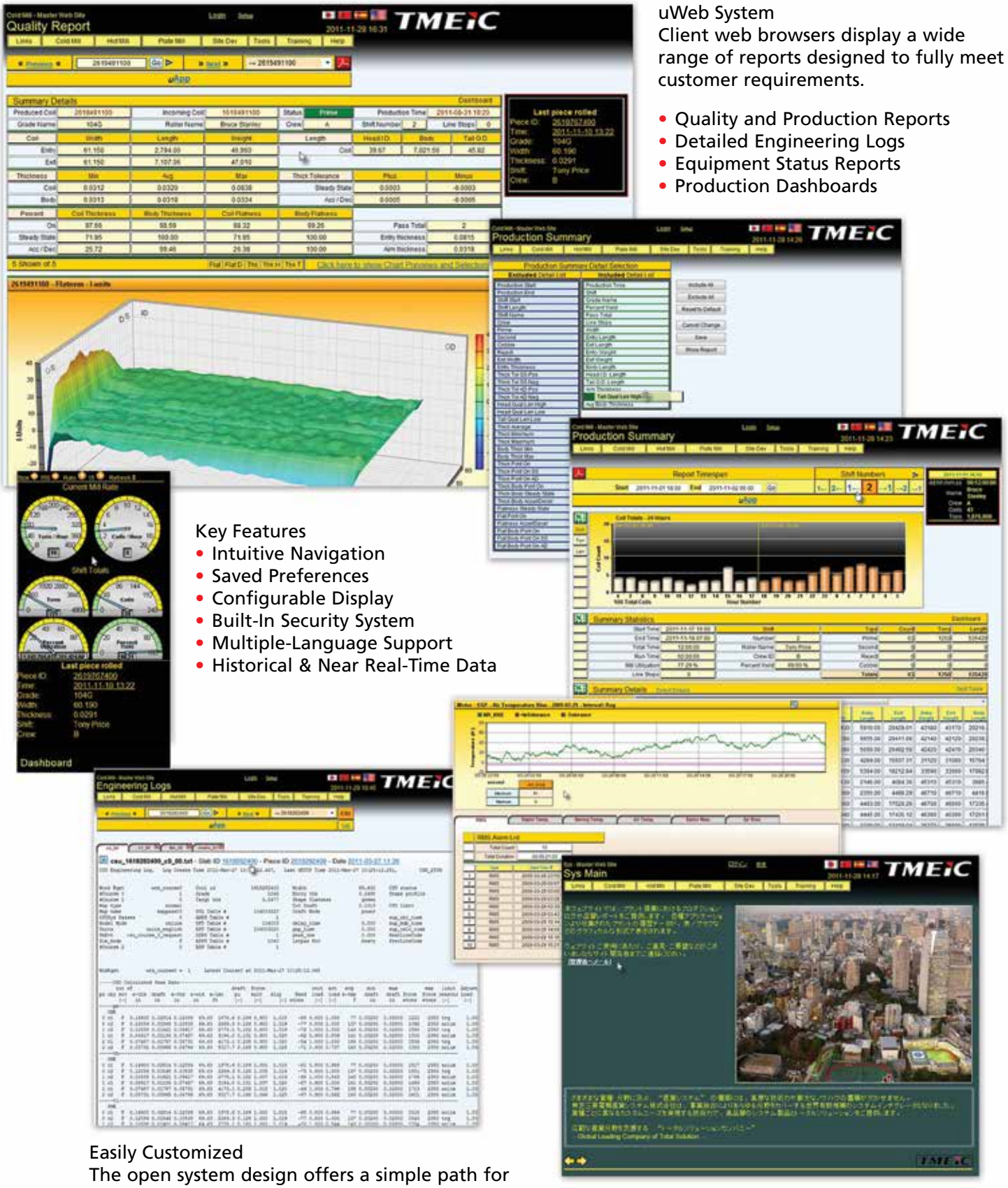
The function of the data storage layer can be outlined as follows:

Data Extraction – Extraction software copies data from the MCS, but is never contained or linked directly into the control code. A typical installation deploys numerous, varied and independent extractors to cover all data gathering needs.

Data Transformation – Raw MCS data is transformed into useful information using business logic. Typical functions include conversion, compression, summing, averaging, sampling, classifying, timing, annotating, and sorting.

Data Loading – The loading function stores the data in a long-term data storage system called the Data Center. This exists on a single computer or can be distributed on many, encompassing a variety of storage formats. Data is organized in a long, flat, two-dimensional, horizontal structure with few, if any, sub-tables.

Website Screens



uWeb System
Client web browsers display a wide range of reports designed to fully meet customer requirements.

- Quality and Production Reports
- Detailed Engineering Logs
- Equipment Status Reports
- Production Dashboards

Key Features
- Intuitive Navigation
- Saved Preferences
- Configurable Display
- Built-In Security System
- Multiple-Language Support
- Historical & Near Real-Time Data

Easily Customized
The open system design offers a simple path for modification or expansion to quickly and safely adapt to ever-changing business needs.

Rolling Mills Engineer

"The first time that TMEIC introduced uWeb to me, its functionality was so impressive that I made sure it was part of the supply scope for our recent Cold Mill automation upgrade. I use uWeb daily to check production, yield, mill utilization, detailed operational delays, and general mill performance. As a technical person, I also use it to research deeper items of the mill. For example, if an operator were to tell me that last week on night shift that he had problems on a specific grade and width, but didn't remember which night, I can quickly go back, review the days he operated the mill and find the block of coils he was referring to. To dig deeper on those coils, I simply drill down on an individual coil quality report; and if necessary, I continue on with the rolling model setup logs and finally the model feedback log. To have that much information at my fingertips by means of a few mouse clicks is simply amazing. As an engineer, we always find ourselves analyzing data, so the uWeb's ability to export its displayed contents to Excel is a very nice feature too."

– Gary Sinders

IT Manager

"I have heard nothing but praises in its ease of use, detail of information and graphic representation. What I can attest to (after inheriting reporting type functions of CSN, LLC) is the overall brilliance put into the design, underlying architecture and supportability. Not only does the product's architecture provide a low learning curve, its platform allows rapid application deployment and seemingly limitless scalability."

– Minor Davis

Production Supervisor

"I use uWeb every day. As the Cold Mill Production Supervisor, it has allowed me to view and research Production, Utilization, and Quality data in half the time. Being a web-based report, allows me to access it from anywhere. I am only a few clicks away if a problem arises. Operators, Millwrights, and Electricians all go online now to view the days Production, Utilization, and Quality. It is very easy to use and supplies the information needed quickly."

– Bo Pershing

Quality Supervisor

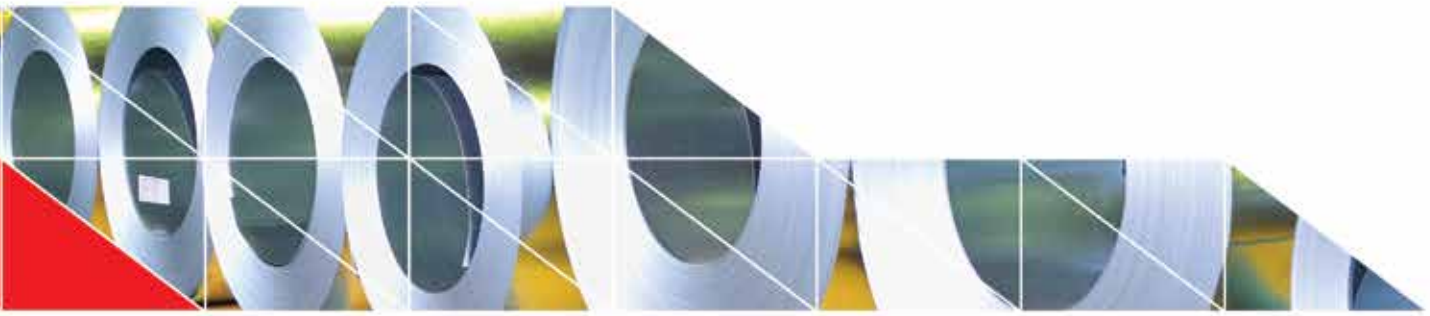
"Ease of use has promoted higher utilization. The gauge and shape graphics are very detailed and offer me the ability to make dispositions using the graphs supplied. I encourage everyone here to use and explore all information available in the uWeb."

– Marty Smith

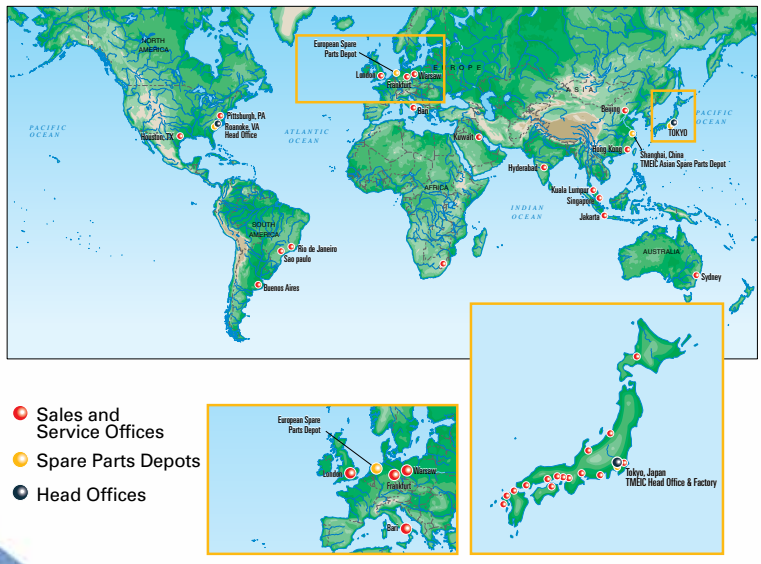
Systems Architect/DBA

"I am a developer and owner of uWeb system so I can appreciate the beauty of its simple architecture and ease of use and maintenance reporting tool which is simple and effective. And because of the use of PHP, SQL Server Express and Virtual server, it's really an open-source solution. It is well designed."

– Paul Singh



Global Support



- Sales and Service Offices
- Spare Parts Depots
- Head Offices

Wherever You Are, We Are Right Next Door

TMEIC has the capability to provide world-wide service support with trained field service engineers. Spare parts depots are strategically located close to main industrial centers.

In Asia & Pacific: Customers are supported by TMEIC service personnel and the TMEIC factory in Japan.

In North America: Customers are supported by TMEIC factory service personnel from Roanoke, Virginia.

In Europe: Customers are supported by TMEIC European service personnel.

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