JAPAN TAPPI JOURNAL

CONTENTS

Process Control and Automation/IoT

Topics & Information

Introduction of Research Laboratories（138）

Next-generation online anomaly detection system using Artificial Intelligence

Motomi Kohata
AI Group, IT service promotion department, Engineering Headquaters, Advanced
Automation Company, Azbil Corporation

  It has been several years since the word AI (artificial intelligence) began to appear
in everyday conversation. This keyword has appeared in various contexts and has
been talked about as a next-generation solution technology with high expectations.
  In this paper, we will briefly introduce the "Online anomaly detection System BiG
EYES *" that we are developing as an advanced predictive maintenance solution
that applies AI.

"PlantLogMeister (PLM)" is contributing to work style reform at the operation site for DX in the pulp & paper industry

Yoshito Katsuki
Toshiba Mitsubishi-Electric Industrial System Corp. (TMEIC)

  In recent years, each company is promoting digital transformation to build next-
generation business models and to strengthen the competitiveness using big data
analysis. As in the process industry, this digital transformation is an urgent task
for safe and stable operation, productivity improvement, and work style reform.
However, in plant operation, the operation diary, which is an important record for
operation, is created by handwriting or Excel document, etc., and it is necessary to
promote the digitalization of the operation site first.
  In this connection, TMEIC is forwarding PlantLogMeister, a system that can
collectively manage data related to plant operations using a unified database of
this operation diary. The implement of this system will contribute to higher work
efficiency, faster troubleshooting, realization of technology transfer, and work
style reform at the operation site.
  In this article, we are focusing on the diary function, which is the basic package,
and introduce examples of applying PlantLogMeister including three topics the
author participated in the development.

Remote Automation Project Service (RAPS)
-A New Project Methodology in the Era of Uncertainty-

Takashi Kai
Honeywell Process Solutions Honeywell Japan Ltd.

  With new threats impacting business on both local and global scales, companies are
adapting rapidly during these unprecedented and challenging times. One aspect
borne out of this is the capacity for project teams to work remotely while ensuring
productivity – a situation that may well be normalized to varying degree for the
foreseeable future. This brings a range of issues and challenges when it comes to
delivering automation projects on time.
To help address this, Honeywell Remote Automation Project Services (RAPS), rooted
in LEAP methodology with enabling technologies, is well placed in providing end to
end capabilities for Design and Implementation, through to carrying out Remote
FAT and Assisted Remote Commissioning.
  This paper will provide the basis and the many benefits that RAPS brings, including:
  • Gaining flexibility in the project schedule
  • Efficient allocation of global resources and expertise
  • Improvements in quality and avoid rework/repetition
  • Significant reduction in travel costs
  • Rapid checkout of target system during FAT

Transition to Smart Factory with Data Integration & Visualization

Takuya Maekawa, Ryohei Watanabe and Soon Hin Loo
Voith Turbo Co., Ltd. BTG Japan

"Smart Factory" means an advanced factory that has implemented "Industry4.0". In other words, "Smart Factory" is a factory that can create a new added value by the "Data Integration & Visualization" with collecting all of operational & quality data thru IoT and utilizing & analyzing the causality of these data.

It is undeniable that the pulp & paper industry has fallen a step behind other industries on the realization of "Smart Factory" although it has accelerated in various industries in recent years. It can be said that the "Smart Factory" is indispensable to find the solutions against the shrinking market, fast change in the market trend, human resource issue, and remote management that will happen in the pulp & paper industry in the near future.

At present, it takes a huge time and labor to collect and analyze data as the operation, quality, and cost information are provided by the different devices & resources, and this is the cause to hinder the quick decision and accurate judgement. In this article, we will introduce dataPARC provided by BTG Capstone that is a leading-edge & user-friendly system for "Data Integration & Visualization".

Proposal of a New Production System with Flexibility and Robustness Corresponding to Changes in the Manufacturing Environment

Kazutaka Fujita , Keiji Sato
Yokogawa Solution Service Corporation

Customers have many missions, such as maintenance, KAIZEN activities and trouble shooting. Manufacturing sites are required to operate more flexible and robustness since customers must not only execute their missions every day, but also respond to changes in the manufacturing environment. To resolve such issues, a paradigm shift of the process management method equivalent to the invention of DCS is necessary.

In this paper, we propose a new production system that has the flexibility and robustness to respond to changes in the manufacturing environment. This white paper outlines the business model, functional model, and system architecture to realize this new production system, and introduces an example of a "hypothesis verification type" workshop conducted with Nippon Paper
Group.

Example of Using a Sign Detection System in a Power Plant -Equipment Diagnosis and Operation Support Using AI-

Atsuhiro Kumagai
Ishinomaki Mill, Nippon Paper Industries Co., Ltd.

In recent years, many systems and tools that utilize AI （Artificial Intelligence） have been put into practical use, but there are few cases of introduction in manufacturing plants. This time, at the Ishinomaki Hibarino Power Plant of Nippon Paper Ishinomaki Energy Center Co., Ltd., we introduced a sign detection system using AI, which could be used as an effective tool for detecting signs of equipment abnormalities and supporting operations.

In this presentation, we will report on these cases.

Introduction example of automatic product transfer equipment using an automatic guided large clamp vehicle

Hiromasa Kondo
Mishima Mill,　Daio Engineering Corporation

The Kawanoe Mill of Daio Paper Co., Ltd. was restarted in October 2018 with the latest equipment as a production base for sanitary paper. Equipped with a Crescent Former paper machine (KN1M/C), toilet winder, tissue interfolder, and ply machine, it produces tissue paper and toilet paper and ships 54,000 tons annually.

The Kawanoe Mill incorporates a wide range of automation, centrally manages papermaking instructions, production control, quality information, and shipping, and automates each production process.

In this paper, we will introduce in detail the automatic guided large clamp vehicle, which is one of the latest automation processes introduced at the Kawanoe Mill.

IoT transformation for Lifecycle business

Kazuhiro Funa
P&S sales department, Voith IHI Paper Technology Co., Ltd.

Voith IHI is focusing on spare and consumable parts business including maintenance service. In this article, we introduce WebShop, SmartBasket and OnCall_Video which is life cycle management system using IoT technology.

WebShop system has been already started up. You can get quotation only in 20seconds, check delivery schedule and order as well. This WebShop equipped with search function as well as operation manual for each devices, which help you to specify the parts. This WebShop can link with smart basket which is an inventory system of basket. Also possible to link with OnCare Asset which is Voith's asset management system.

OnCall.Video is an audio-visual communication system that enables worldwide access to Voith's expert knowledge via an internet-based video collaboration platform. With this service you can be supported by real-time analyses anytime. Furthermore, this solution also offers many valuable use cases for improving internal communication. OnCall.Video enables the expert to see in real time exactly what you see at the paper machine, to display relevant information and drawings and thus provide concrete instructions and assistance.

Cooperative Optimization Control Solution for in Paperboard Process

Atsushi Toyoda
IA-PS Analyzer Center P&W Solutions Dept., Yokogawa Electric Corporation [*2]

With the aim of improving the pulp and paper manufacturing process, we have released a Cooperative Process Optimization solution service in 2019.This paper will first describes the data collection and analysis service, which is the main part of this service. This paper then presents a case study of a paperboard machine.

Valmet products which have both improved safety and better workability

Kiyoshi Yaguchi
Valmet K. K.

There is one famous theory as known as Heinrich's Law: For every accident that causes a major (1) injury, there are (29) accidents that cause minor injuries and (300) accidents that cause no injuries. For avoiding a major accident, it is necessary to eliminate with this at near-miss stage when an accident or disaster is predicted. In the background of major accidents there is a stack of small near-misses. Thus, small risks that could lead to serious accidents must be eliminated in advance thorough 5S, Kaizen activities, near-miss reporting, regular safety patrols.

On the other hand, depending on the type of work, the safety depends on the equipment used for work, so there is something that cannot reduce the risk of an accident just by paying attention to safety. In order to achieve zero accidents, it is necessary to update equipment, which may result in investment costs. However, productivity and working conditions improve when processes become safe. In other words, it is no exaggeration to say that efficiency and safety are closely related, and safety will make profit. On this report, equipment that achieves improved workability while ensuring improved safety are introduced.

Revolutions in the history of civilization induced by paper
Part 2: From bamboo and wooden slips to paper   -Invention in China

Kiyoaki Iida

In China, written characters came into use in the 11th century B.C. , and successive dynasties wrote their histories on bamboo and wooden slips insistently.   In the fifth century B.C., the genres of philosophy and literature were invented. Bamboo slips were used by those concerned to discuss their opinions and record their outcomes, and helped develop a new kind of culture. Bamboo scrolls, however, were very bulky and person's knowledge was expressed as an equivalent volume of a number of loaded carts.

Then, Cai Lun invented a new paper making process in 105. He made use of bast fiber such as paper mulberry and hemp instead of wasted textile products in an old method, and produced paper of high quality. He was credited for the invention and its spread in the country. His paper gradually replaced bamboo slips, due to its easier handlings, higher recording density and probably less cost.

As civilization developed and population grew, the demand for paper increased for which fiber supply got short. A complement was bamboo, which gradually replaced paper mulberry itself. Bamboo, after repeated retting in water and boiling in solution containing wood ash, could be pulped with pounding, though more times of repeating were required than those for paper mulberry. Bamboo paper could be manufactured in a larger scale, due to its abundance in resource, and would be competitive in cost to that of paper mulberry. Bamboo fiber is thinner and shorter, and is formed to a sheet of smoother surface. Wood block printing became popular in the Song dynasty and was at its peak in the Ming and the Qing dynasties, and would prefer bamboo paper because of its better printability.