OPC as Future Communication Protocol in Industrial Automation

Plus : Studi Kasus – Perusahaan X

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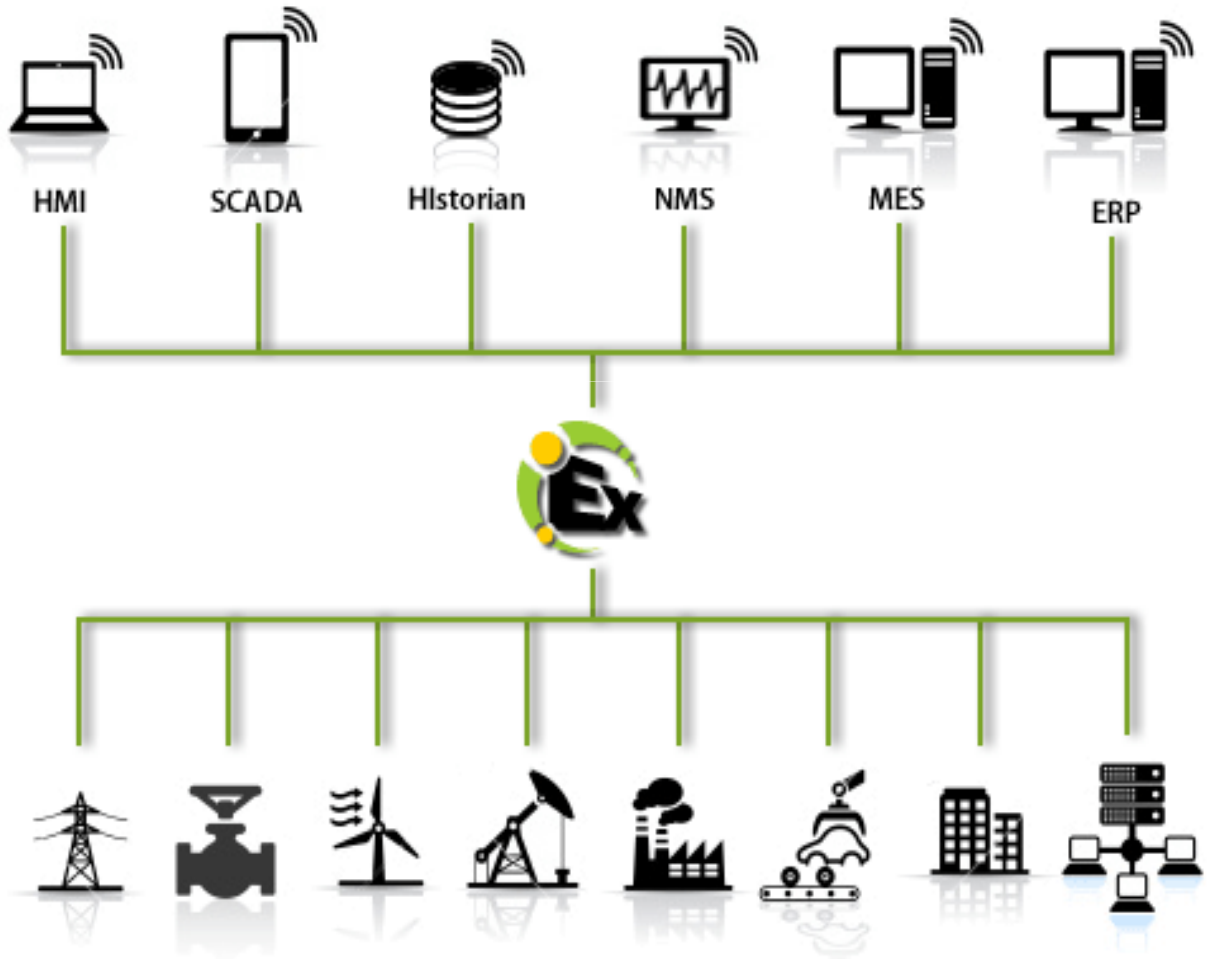
Overview

- OPC : What and Why
- OPC Architecture
- OPC Application
- Case Study – Perusahaan X
  - OPC Application on Perusahaan X
  - Lessons learned

OPC Definition (1)

- OLE for Process Control (OPC)
- A software interface technology used to facilitate the transfer of data between industrial control systems, Human Machine Interfaces (HMI), supervisory systems and enterprise systems such as historical databases

OPC Definition (2)

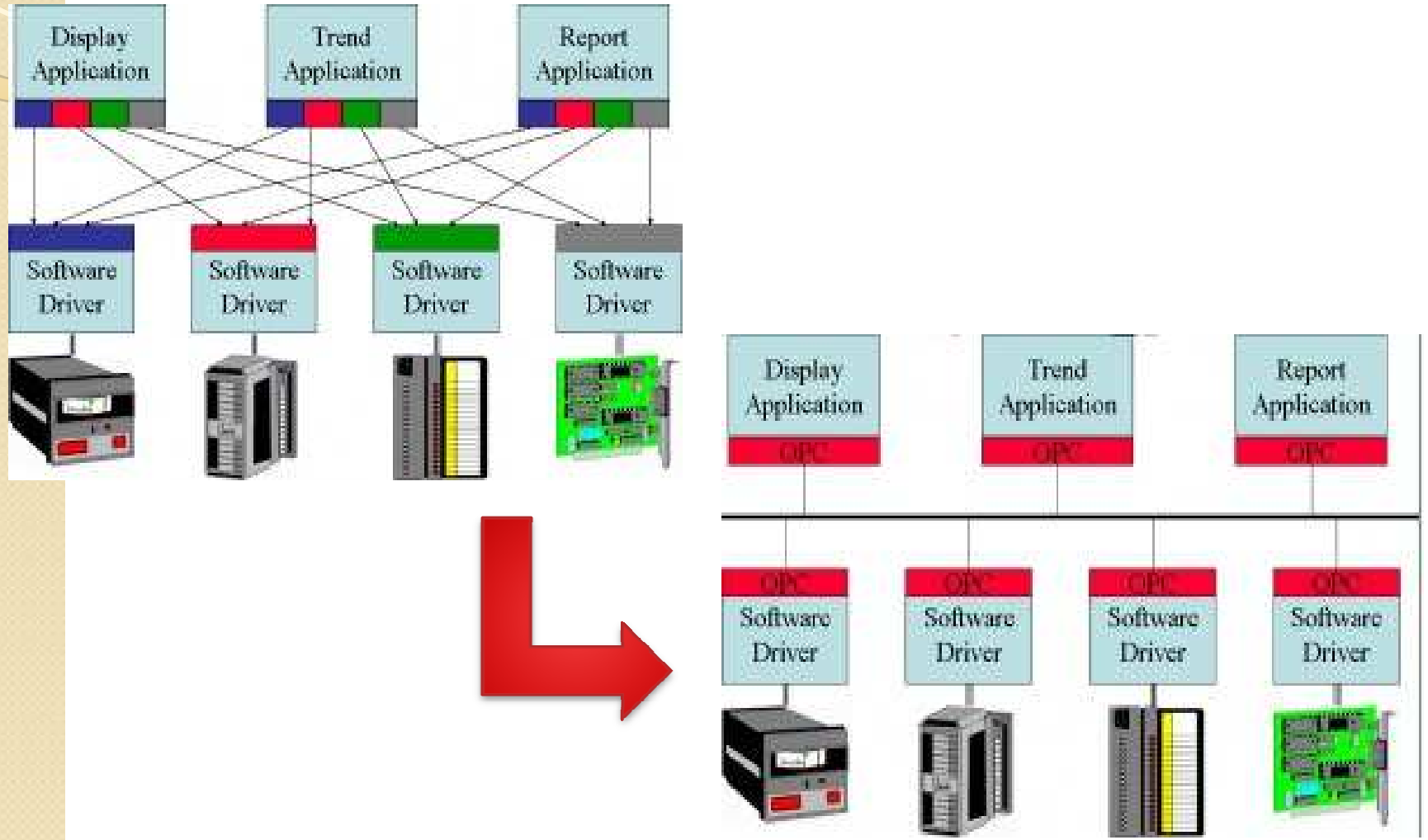


Primary Value of OPC (1)

- OPC provides a common interface for communicating with diverse industrial control products,

  regardless of the software or hardware used in the process
- OPC is open connectivity through the creation and maintenance of open standards specifications

Primary Value of OPC (2)



What OPC doesn't do

- OPC does not eliminate the need for drivers
- Each manufacturer develops an OPC server for their specific product using whatever protocol their device needs since they are best suited to build a server that will take full advantage of their product

OPC Scheme

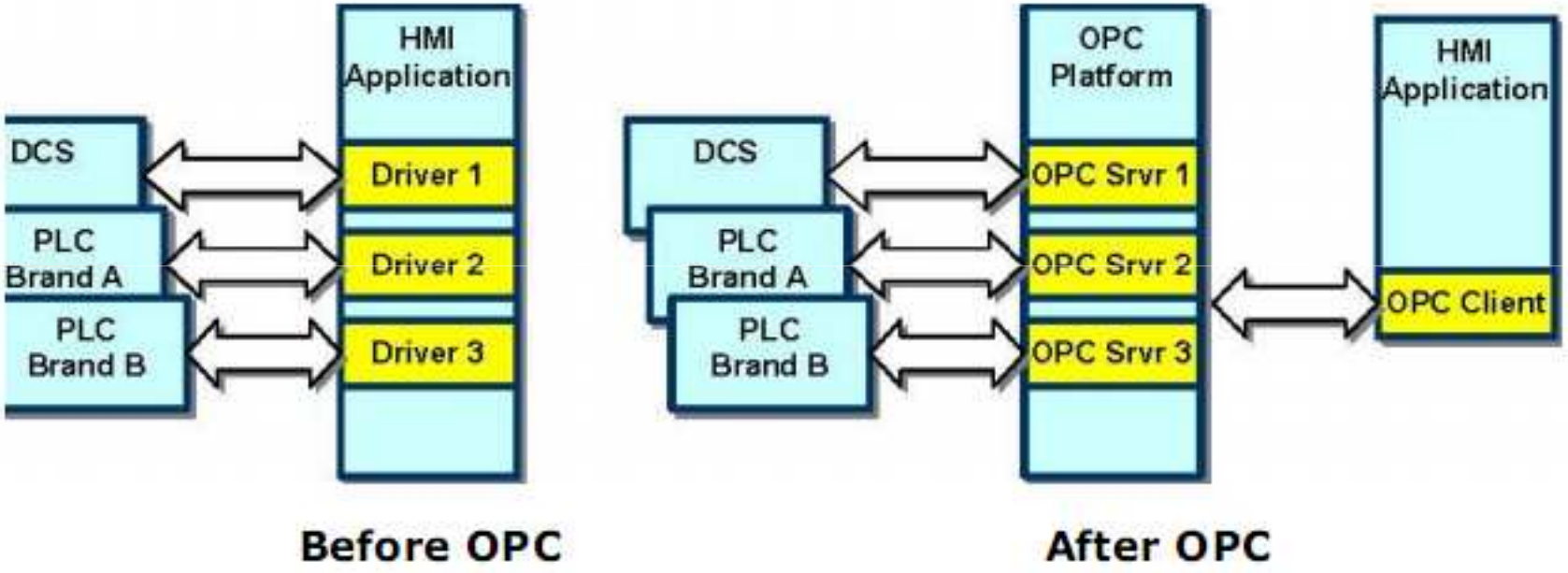


Figure 2-1: OPC Efficiency in Driver Development

OPC Technology

- OPC is based on Microsoft's Distributed Component Object Model (DCOM) technology
  - Object Linking and Embedding (OLE) → Component Object Model (COM) → DCOM

OPC Layering

- OPC is an Application Programming Interface (API) and not an "on the wire" protocol

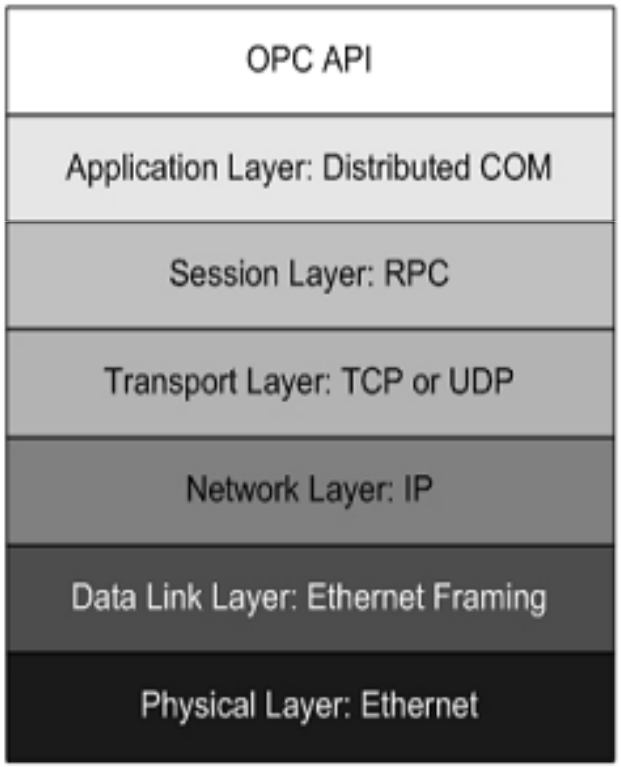


Figure 4-1: OPC Layering

OPC Architecture

- OPC is based on a client-server architecture

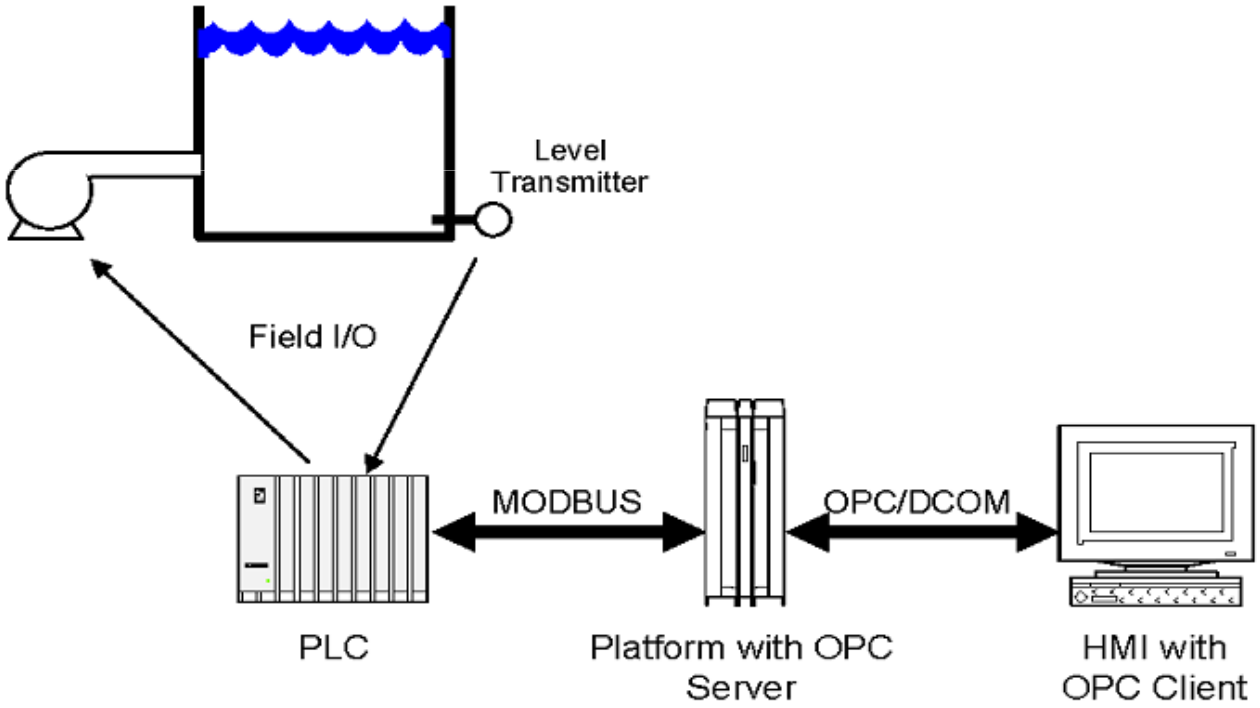


Figure 2-2: Example of Possible OPC Client-Server Architecture in Tank Level Control

OPC Server and OPC Client

- Application that gathers information from devices (e.g PLC) using device's native protocols (e.g MODBUS)
- OPC server provides access to this data via COM objects & method calls, allowing multiple OPC clients to indirectly read and write to the field device via the OPC server

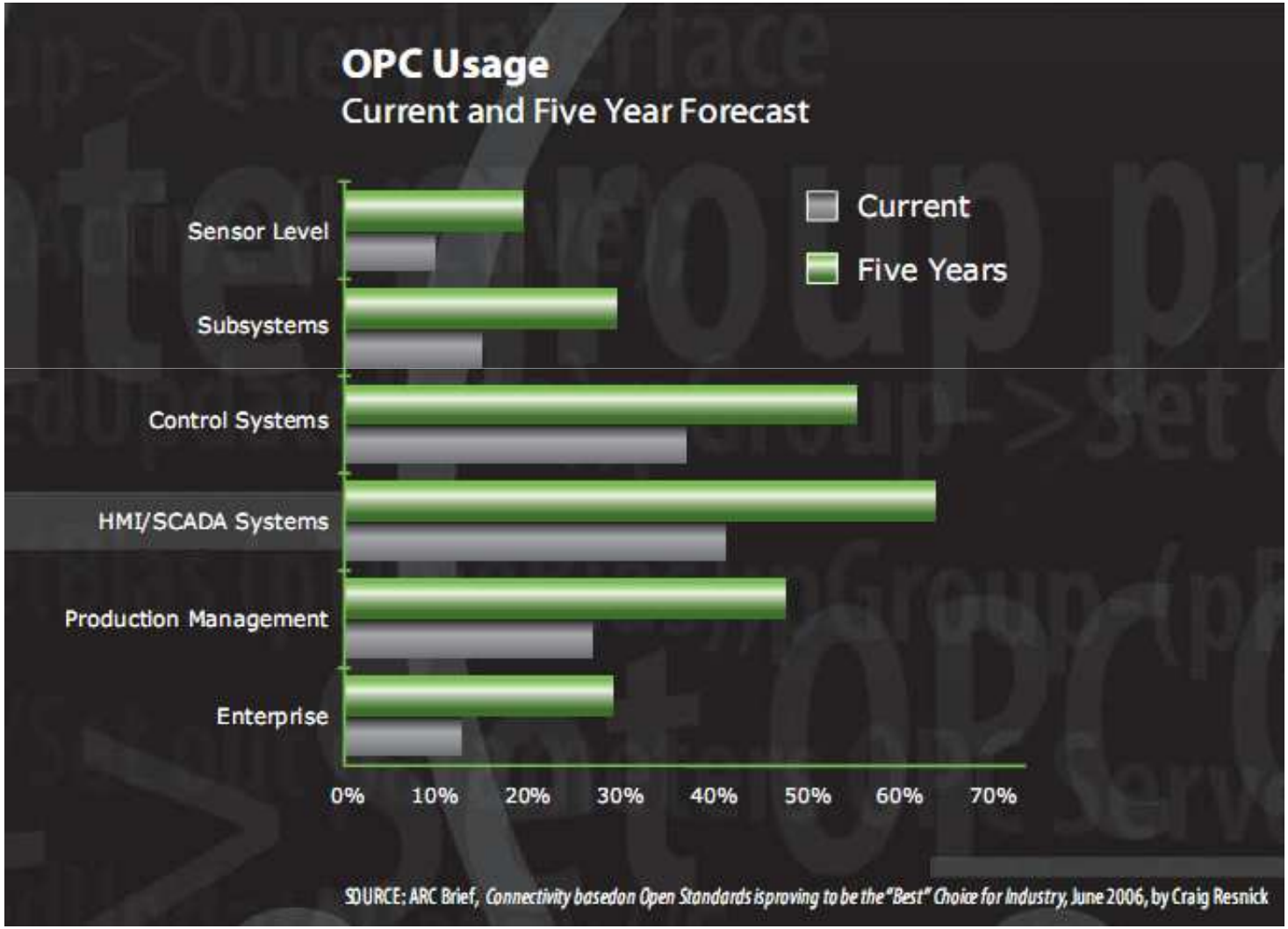
OPC Application in the market

- KepServerEx from Kepware

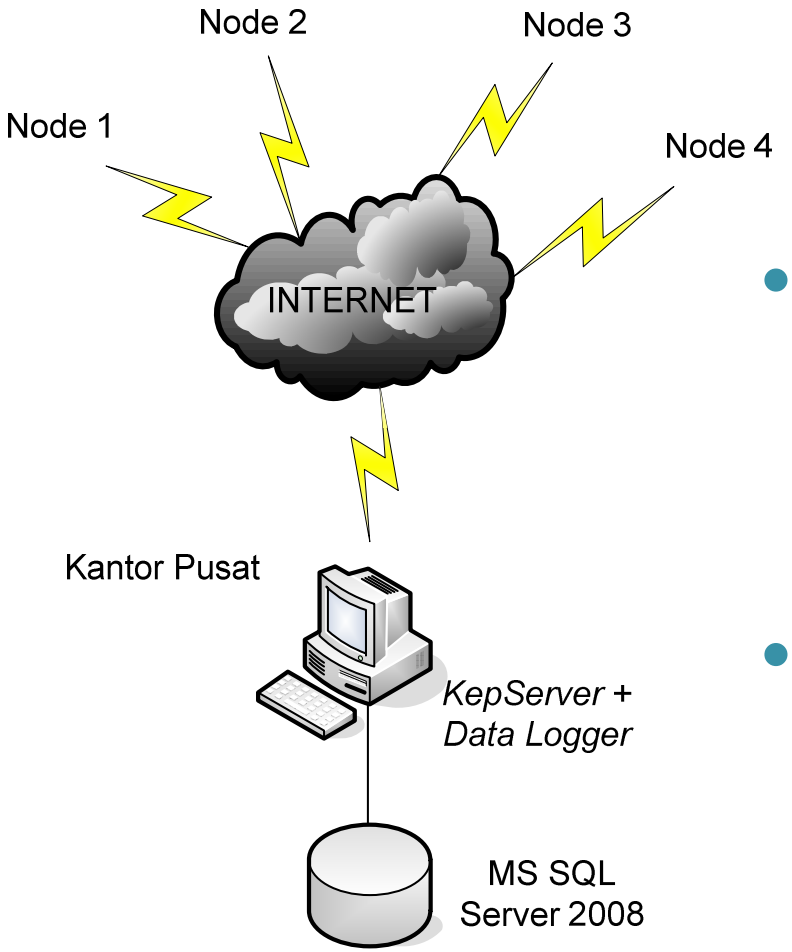
- OPC Data Hub from Cogent

- OPC Systems.NET from Open Automation

Future of OPC



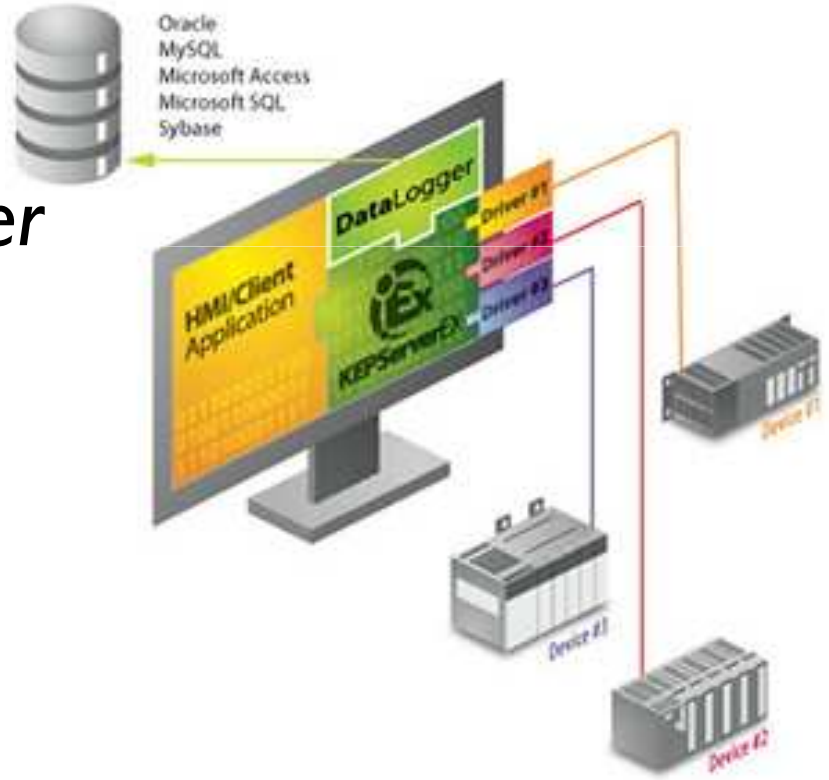
Study Case –Perusahaan X (1)



- Menyimpan data dari *smart sensor* di berbagai area ke *database* → OPC team
- Membuat aplikasi *web* secara *real time* yang menampilkan data tersebut → IT team

Study Case –Perusahaan X (2)

- Konfigurasi *KepServerEx* (OPC server) yang membaca data alat
- Konfigurasi *DataLogger* (*add-ons KepServerEx*)



Study Case –Perusahaan X (3)

- Konfigurasi *DataLogger* (*add-ons KepServerEx)*
  - Ambil *tag name* dari OPC Server
  - Atur koneksi ke database (DSN)
  - Menyimpan ke tabel baru/*existing*
  - Konfigurasi durasi penyimpanan ke *database*
- Konfigurasi (sederhana) SQL Server 2008
  - Desain tabel, tipe data
  - Remote connection for SQL (test :VM Ware)

Lesson Learned

- Otomasi industri modern tidak terpisahkan dari IT/komputer
  - Nilai plus bagi lulusan Teknik Elektro
- Sikap mau dan tekun belajar merupakan "modal" penting untuk *engineer*
  - *OPC, jaringan, database, VMWare dll*
- Pentingnya "mentor" dan "koneksi" dalam dunia kerja