ISA

Cloud-iPad Era.

Real-time Industrial automation software, evolving with technology!

Standards

Certification

Education & Training

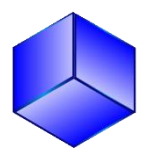Publishing

Conferences & Exhibits

Presenter

Marcos Taccolini is a recognized expert in real time systems and has spent over 25 years designing products for manufacturing and process automation, brand-labeled to dozen of companies around the world.

Marcos is currently the **CEO** and Founder of **TATSOFT** llc; which provides the state-of-the-art **FactoryStudio** Enterprise Framework Product, the Microsoft .NET software platform to develop and deliver secure applications and system solutions based on the latest technologies from **Microsoft** and **Apple**.

Major shifts in software technology

- Platform Evolutions
    - Hardware
    - Software
- Another major shift occurring today
- Planning for the next decade
    - Real-time distributed applications
    - Architectures
    - Data models
    - Simple Practical Cloud Applications

Driving progress in technology

- Historically
  - Major hardware or software development
- Today
  - Combining a decade of changing and emerging technologies
- Growth in Key technologies:
  - Communication Bandwidth on Networks
  - SaaS
  - Cloud
  - IT Depts. Implementing .Net Framework
  - 64-Bit OS
  - Multi-Core CPUs
  - Advanced Graphics
  - iPad/iPhone

VAX   **DOS**   **Windows 16-bit / 32-bit**

Microsoft .NET

iPads/iPhones

Microsoft .NET, Multi-Core CPUs, Direct-X Graphics
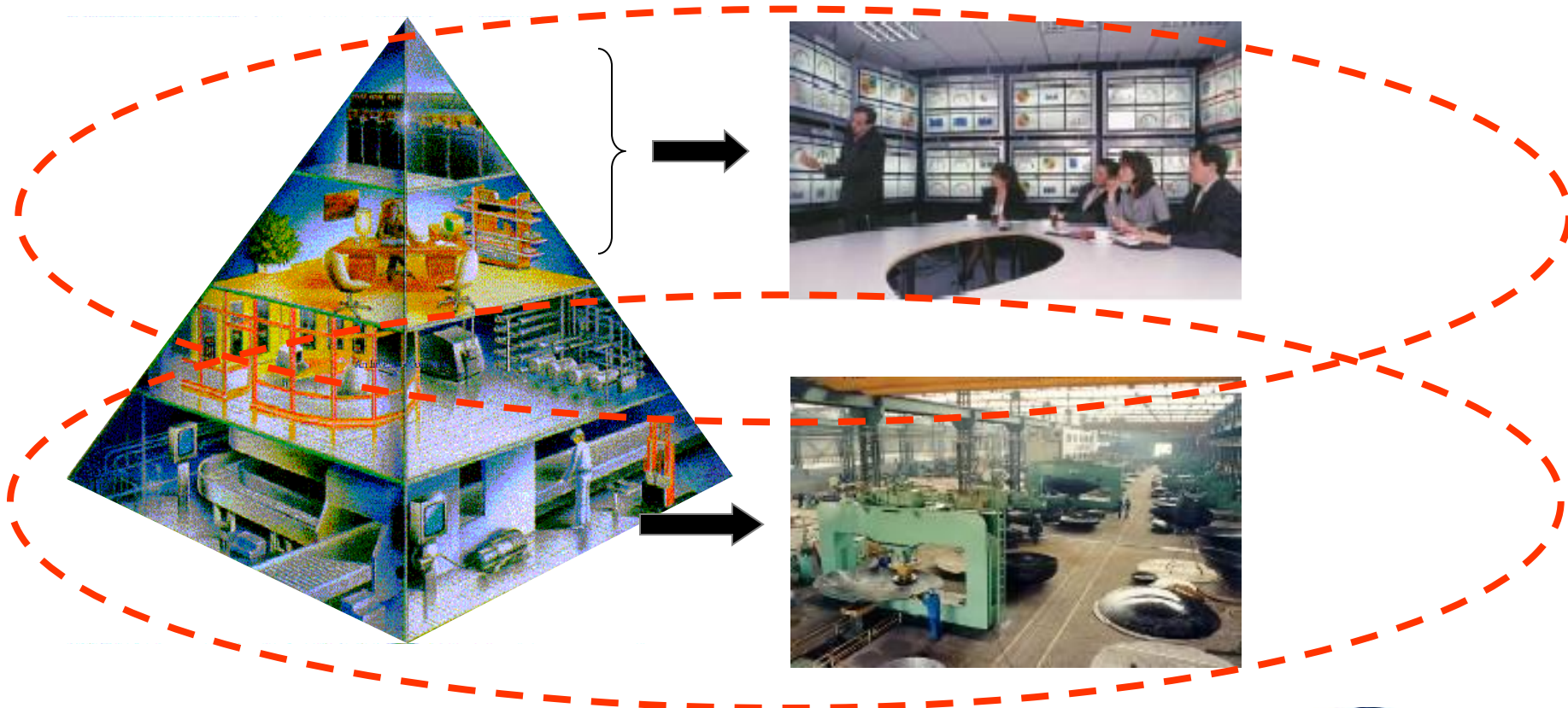
Back in the day…..

Today…..

In order to *fully leverage* new features and enhancements in *today's operating systems and devices*, it becomes necessary to develop new software solutions from the kernel up.

IT and Factory floor integration

Leveraging experience and today's state-of the art technologies, FactoryStudio combines the IT and Factory-Floor visions.

Designed from ground up targeting enhanced quality assurance and productivity for the *entire* project cycle.

Driving progress in technology

- New technologies
  - Lead to new architectures
  - More efficient and reliable
- New generation trends
  - Server consolidation (SQL and Real-Time database)
  - Data models based on structured assets
  - New data objects (Events, Queries, Tables)
  - iPad-like engineering tool interfaces
  - Distributed concurrent engineering environment
  - Context and Distributed role-based driven data access and storage
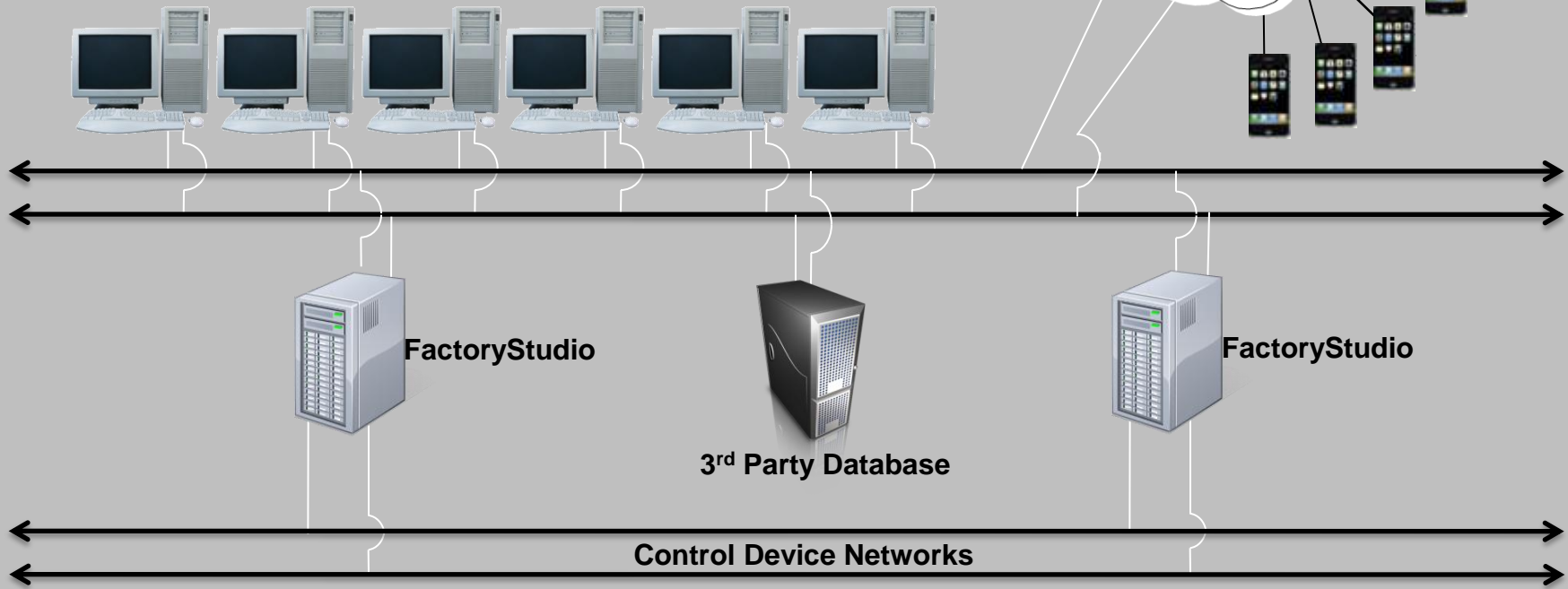
Migrating to highly distributed systems including cloud and iOS platforms

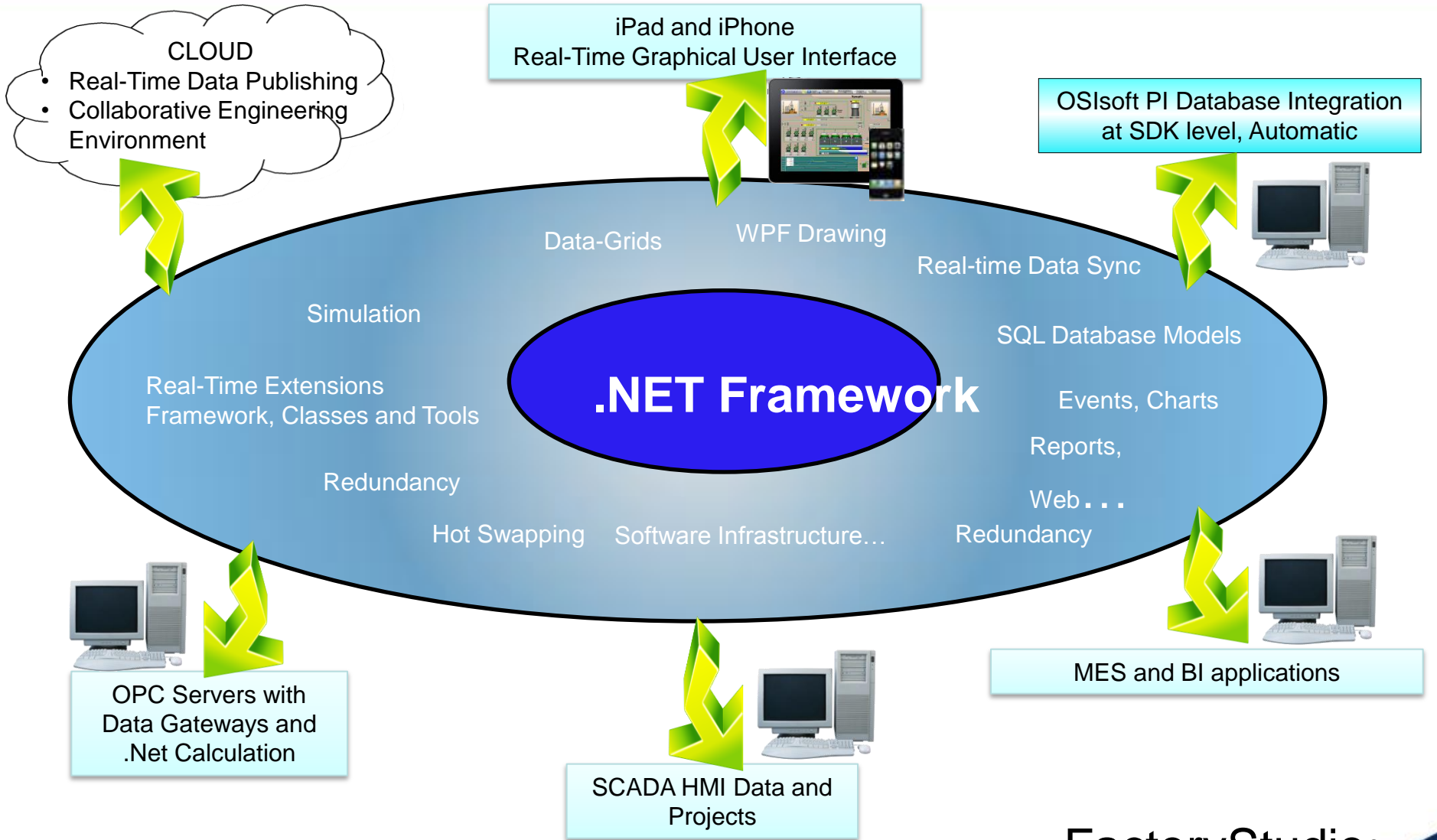- Redundant Servers
- Cloud connectivity
- PC and iPad/iPhone Client

Nothing new here!

Today however

Engineer/End Users

FactoryStudio

3rd Party Database

FactoryStudio

Control Device Networks

Todays desired Architecture

CLOUD
- Real-Time Data Publishing
- Collaborative Engineering Environment

iPad and iPhone
Real-Time Graphical User Interface

OSIsoft PI Database Integration at SDK level, Automatic

.NET Framework

Data-Grids

WPF Drawing

Real-time Data Sync

Simulation

SQL Database Models

Real-Time Extensions Framework, Classes and Tools

Events, Charts

Reports,

Redundancy

Web . . .

Hot Swapping

Software Infrastructure…

Redundancy

OPC Servers with Data Gateways and .Net Calculation

SCADA HMI Data and Projects

MES and BI applications

FactoryStudio

Real-Time Data Manager

Traditional legacy real time database	Real-time kernel on Cloud-iPad Era
Tag types: digital, analogic, float (real) and texts reflecting the automation equipment.	In addition, also manages events, tables, queries, and structured data reflecting the process monitored assets.
Server-centric processing	Distributed processing as the function between the server, client and advanced control stations.
Proprietary access Interfaces	Access via Interfaces classes.NET or services
Definition of variables on proprietary files	Definition of variables in standard databases with support for SQL and ADO.NET
Does not allow hot swapping	Allows hot update swapping (change configuration with stopping runtime services)

What is a Cloud-based solution in this context

- Any application where the Internet technologies play a major role on the solution
  - Data exchange outside company firewall
  - Shared internet infra-structure
  - Distributed solution assets or resources
- Cloud application
  - Private or Public
  - Publish data on internet
  - Collaborative system engineering
  - Infrastructure as transport layer for corporate apps

Real-Time Data Publishing

- Execution of Cloud-based application
- Real-time access to remote information
- Project Server
  - Hosted by the user
  - Third Party hosting
  - Receives data published from multiple on-premises apps
  - Runs as Web Service (Secure connections)
  - Automatically pushes real-time data to client apps, smart devices

Collaborative Engineering On The Cloud

- Application development and deployment
  - "Engineering on the Cloud"
  - Allocate engineering resources from multiple locations
  - Work on same or many projects simultaneously
- Real-time Access to information
  - Most Common perception of Cloud use
  - Remotely running applications
  - Real-time Data Publishing
- Centralized Project definition
  - VPN or ISP
- Version Control and Change Management
- Lack of or cumbersome legacy system collaboration

OEM and Machine Builders- Version Management

- Cloud engineering impact
  - Cost reduction
  - Easier system maintenance
  - Enhance service quality
  - Distribute projects to installed base
  - More time for more projects
- Development platforms supporting previous versions
  - Reduce software maintenance and hardware costs
  - Create and track project version releases
- Retail Store Utilities monitoring example

Intellectual Expertise and Optimization Services

- Providing Services – Historically
  - Face-to-face consulting
  - Furnace Optimization, KPI monitoring, Loop tuning, Alarm optimization, etc., via historical analysis

- Providing Services- Today
  - Through Cloud integration, information automatically pushed to those who need it, when and where they need it

- Creation of new service business model

Automated Data Analysis Services

- More efficient
  - Collection client historical data
  - Analysis of data

- Equipment Manufacturer
  - Visibility of on-site applications
  - Automated exchange of data to be analyzed
  - Remote date normalization and summarization
  - Direct on-line feedback to consumers

- Remote Predictive Maintenance
  - Monitoring
  - Notification
  - Safer than going on-site in many cases

Intrinsically Distributed Applications

- Monitoring born for the Cloud
    - Telecommunication infrastructure
    - Geographically distributed assets
    - Agricultural Weather and irrigation
    - Many more…. What about yours?
- Mix on-premises and Cloud-based tools
- Local apps always needed
    - Physical device connectivity
    - Store and Forward when needed or desired

iPad, iPhone and Smart Clients

- Fast growing use in business
- Reach your information
  - From anywhere you want or need to be
- Impact of Cloud technologies
  - Collect on premises real-time data applications
  - Access through Gateway Servers
- Project decisions
  - Delivery of information
  - Alarm Notification and Acknowledgement
  - Remote input to control systems
- iOS Native Apps
- Safe enough for Banks!
  - It's inevitable. Identify the right application for your company!

User Interface paradigms for the next generation of engineers

iPad and iPhone also raised user expectations and changed UI paradigms

Thank you for your time!

Marcos Taccolini- President