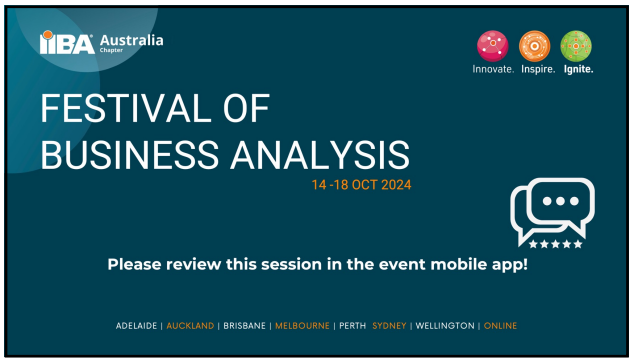
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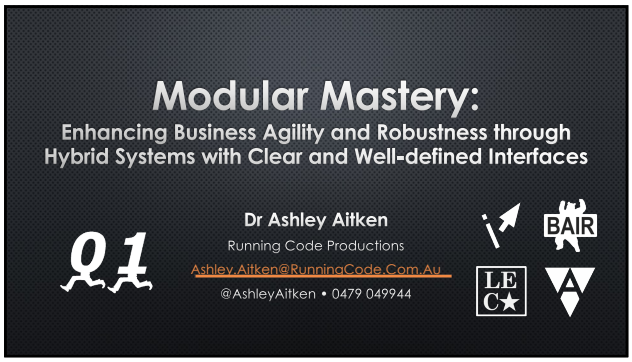
Modular Mastery:
Enhancing Business Agility and Robustness through Hybrid Systems with Clear and Well-defined Interfaces
Q1
Dr Ashley Aitken
Running Code Productions
Ashley.Aitken@RunningCode.Com.Au
@AshleyAitken • 0479 049944
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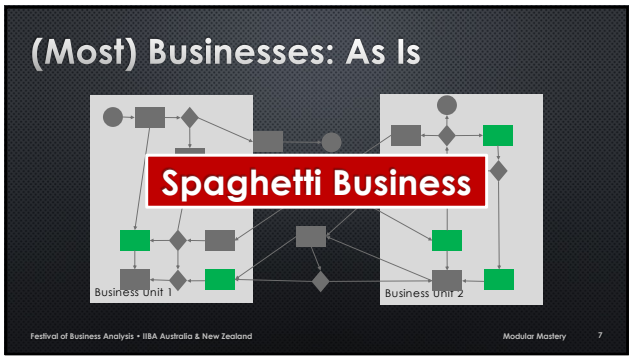
(Most) Businesses: As Is
Spaghetti Business
Business Unit 1
Business Unit 2
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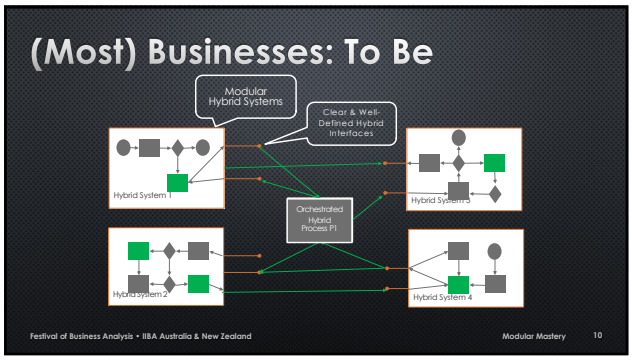
(Most) Businesses: To Be
Modular Hybrid Systems
Clear & Well-Defined Hybrid Interfaces
Hybrid System 1
Orchestrated Hybrid Process P1
Hybrid System 2
Hybrid System 4
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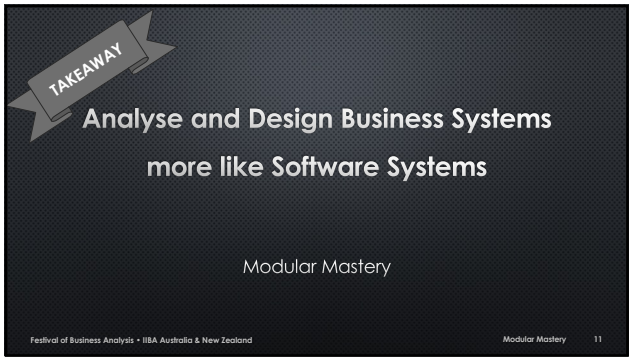
TAKEAWAY
Analyse and Design Business Systems more like Software Systems
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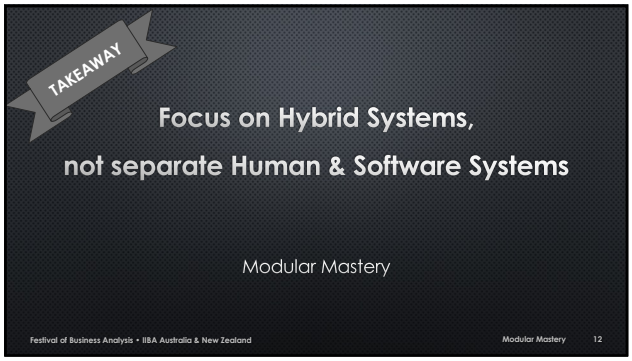
TAKEAWAY
Focus on Hybrid Systems, not separate Human & Software Systems
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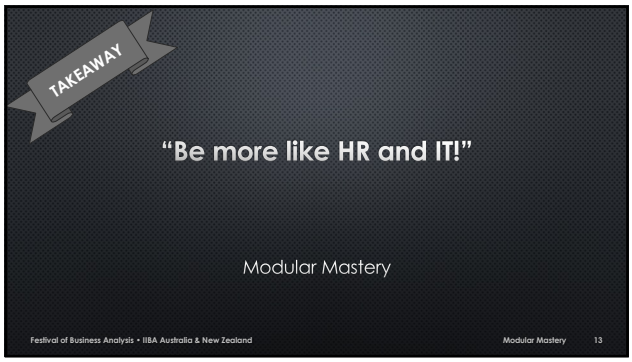

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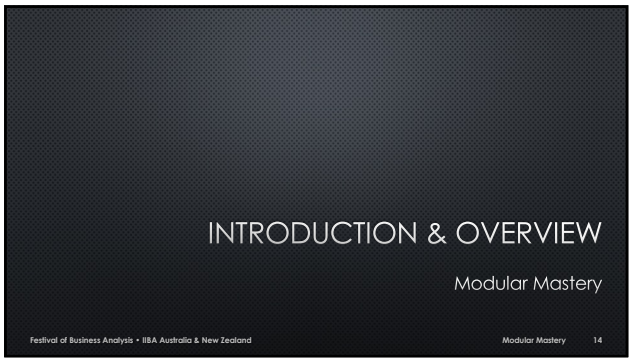

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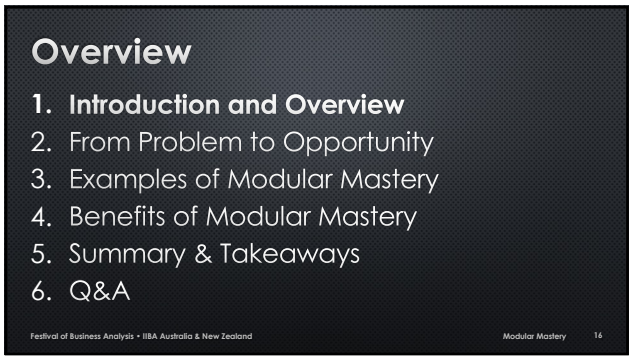

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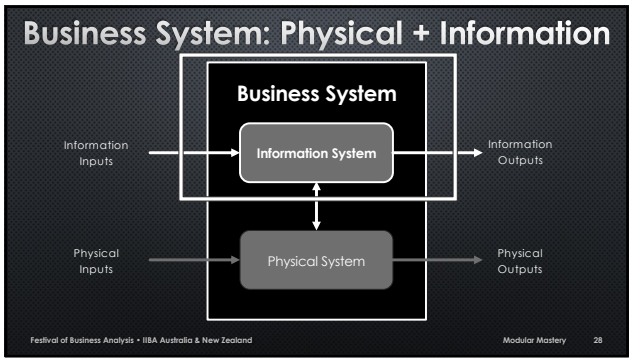

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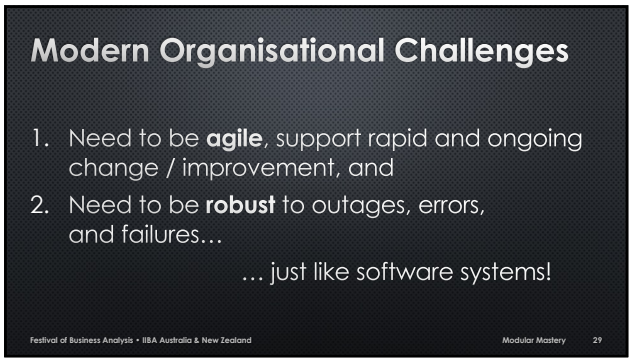

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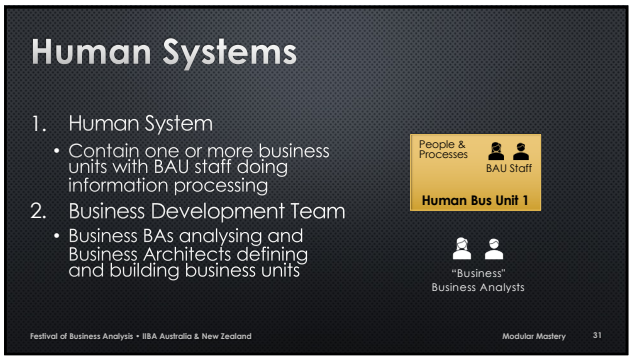

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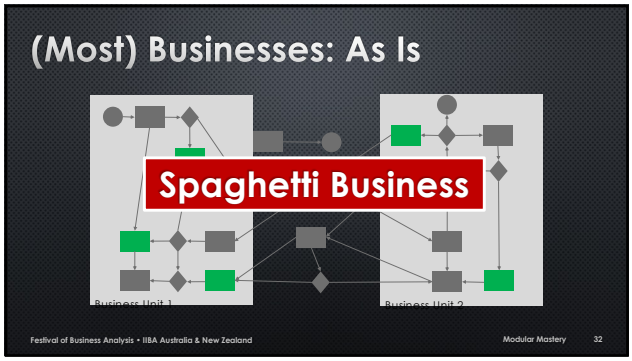

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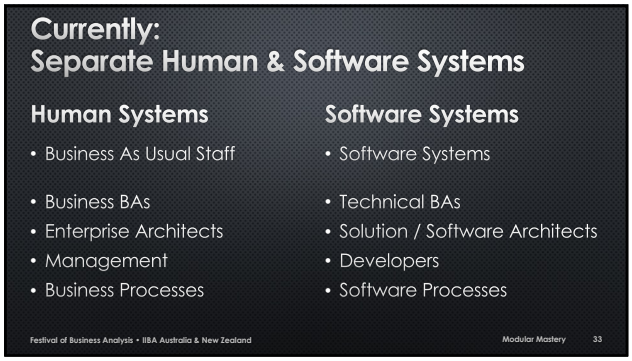

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The Problem with Separate Systems

1. Different teams and different approaches with human and software systems,
2. Separate sets of processes for human systems and software systems, and
3. Development of human and software systems are funded separately and differently.

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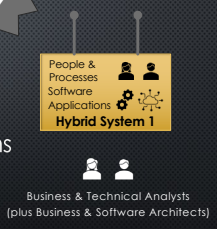
Hybrid Systems

NEW

1. Hybrid Systems
   - Human & Software Systems Combined
2. Hybrid Development Teams
   - Business Analysts and Business & Software Architects



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The Opportunity of Hybrid Systems

1. One integrated approach of human and software systems analysis and design,
2. One ongoing funding model for iterative and incremental improvement (i.e. hybrid v2.1, v2.5)
3. Easily move functionality from human systems to software systems and vice-versa.

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FIVE EXAMPLES OF MODULAR MASTERY

Modular Mastery

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Five Examples of Modular Mastery

1. Finding Modules
2. Information Hiding
3. Clear & Well-Defined Interfaces
4. Synchronous vs Asynchronous Operations
5. Orchestrated vs Choreographed Processes

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1. FINDING MODULES

Modular Mastery

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Finding/Designing Software Modules

- We decompose software systems into modules based on **cohesion & coupling**
- We aim to:
  - **Maximise Cohesion** & **Minimise Coupling** between the software modules.

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Finding/Designing Hybrid Systems

- We should decompose businesses into hybrid systems based on **cohesion & coupling**
- We should aim to:
  - **Maximise Cohesion** and **Minimise Coupling** between hybrid systems.

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2. INFORMATION HIDING

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Information Hiding for Software

- We generally hide the internals of a software module from other modules.
- Enables agility and robustness in software systems!

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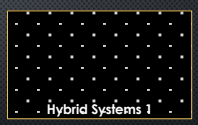
Information Hiding for Hybrid Systems

- We suggest hiding the internals of a hybrid system from other hybrid systems.
- Enables agility and robustness in hybrid systems!



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But If the internals are hidden how do hybrid systems interact with other hybrid systems?

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3. CLEAR & WELL-DEFINED INTERFACES

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Software System Interfaces

Types of Interfaces

1. Graphical User Interfaces (GUIs)
2. Application Programming Interfaces (APIs)
   - Commands, Events, Views/Queries
   - Request-Response
   - …

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Worse ways to integrate Software Systems

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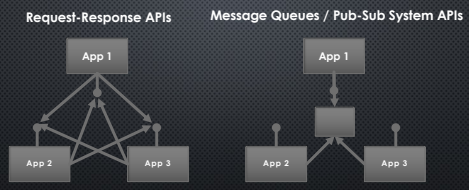
Better ways to integrate Software Systems



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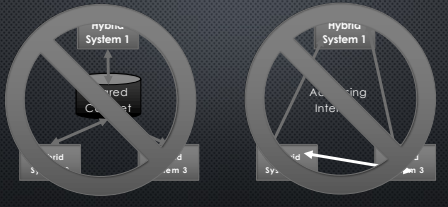
Worse Ways to Integrate Hybrid Systems



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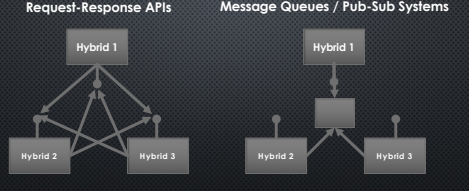
Better Ways to Integrate Hybrid Systems



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Human System Interfaces?

Human Interfaces?

- Email
- Printed or Online Forms
- Face-to-Face Conversation
- Direct Telephone Calls
- Telephone Answering Machines
- …

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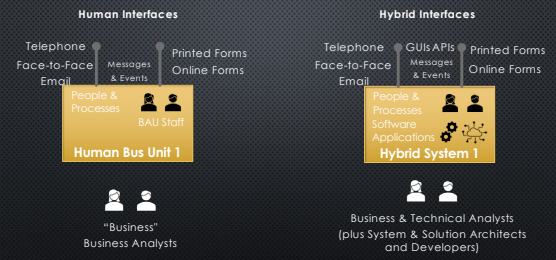
Hybrid System Interfaces



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4. SYNCHRONOUS VS. ASYNCHRONOUS OPERATIONS

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Sync vs. Async Software Interfaces

Synchronous Interfaces – Sequential Ops

- Request-Response

Asynchronous Interfaces – Parallel Ops

- Message Queues
- Pub-Sub Systems
- …

Preferred

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Sync vs. Async Human Interfaces

Synchronous Human Interfaces

- Telephone
- Face-to-Face

Asynchronous Human Interfaces

- Email / Shared Email Box
- Forms – Online or Printed
- Telephone Answering Machine

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Interface Preferences

- Software Systems
  - Prefer asynchronous interfaces to enable scaling, robustness, and scaling
- Human & Hybrid Systems
  - Prefer asynchronous interfaces to enable agility, robustness, and scaling

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5. ORCHESTRATED VS CHOREOGRAPHED PROCESSES

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Types of Processes

1. Orchestration

- Involves a central coordinator that controls the interactions between different parts.

Benefits include centralised control, simplified interactions, easier error handling, and clear process visualisation.

2. Choreography

- Individual parts communicate directly with each other as need to form processes.

Benefits include decentralisation and autonomy, scalability, flexibility and evolution, and elimination of single points of failure.

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Software System Processes

1. Orchestrated Software Processes
   - For complex processes, span multiple applications and may need to be tracked and/or rolled back.
2. Choreographed Software Processes
   - For simpler processes that span multiple applications but don't need to be tracked or rolled back.

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Hybrid System Processes

1. Orchestrated Hybrid Processes [Default ☹]
   - Only when necessary, i.e., need to track progress and possibly roll-back process, e.g. sales.
2. Choreographed Hybrid Processes
   - Preferred because easy to change individual module behaviour without involving others.

Be aware of this when modelling business processes!

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BENEFITS OF MODULAR MASTERY

Modular Mastery

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A Modern Software Approach

Historically, software was developed like one-off projects…

- Employed a waterfall delivery of predefined requirements and value.

Modern approach realises software is never really finished…

- Embrace an ongoing iterative & incremental delivery of value.

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A Modern Business Approach

Current, business improvement is usually done in one-off projects…

- Employs a waterfall delivery of predefined requirements and value.

Suggest we realise hybrid systems are also never really finished…

- Embrace an ongoing iterative & incremental delivery of value.

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Benefits of this Modern Product Approach to Software

An improved focus on:

- Customer Service – Internal and External,
- Data-Driven Insights,
- Independent Development,
- Continuous Improvement, and
- Automation and Operational Efficiency.

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Potential Benefits of this Modern Product Approach for Hybrid Systems

Potentially improved focus on:

- Customer Service – Internal and External,
- Data-Driven Insights,
- Independent Development,
- Continuous Improvement, and
- Automation and Operational Efficiency.

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Benefits of Software Modular Mastery

Software **Agility**

- Faster Adaptation to Change
- Parallel Development and Innovation
- Incremental Improvements and Iterative processes
- Scalability and Flexibility
- Simplified Testing and Deployment
- Enhanced Collaboration and Communication
- Reduced Dependency and Bottlenecks
- Resilience to Disruption
- Faster Learning and Adaptation
- Better Risk Management

Software **Robustness**

- Isolation and Containment of Problems
- Simplified Troubleshooting and Resolution
- Ease of Maintenance and Adaptation
- Resilience to Change
- Scalability and Growth
- Improved Collaboration and Efficiency
- Minimised Risk of Systemic Failures
- Enhanced Security and Compliance
- Facilitated Recovery and Continuity
- Better Risk Management

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Benefits of Business Modular Mastery

Business **Agility**

- Faster Adaptation to Change
- Parallel Development and Innovation
- Incremental Improvements and Iterative processes
- Scalability and Flexibility
- Simplified Testing and Deployment
- Enhanced Collaboration and Communication
- Reduced Dependency and Bottlenecks
- Resilience to Disruption
- Faster Learning and Adaptation
- Better Risk Management

Business **Robustness**

- Isolation and Containment of Problems
- Simplified Troubleshooting and Resolution
- Ease of Maintenance and Adaptation
- Resilience to Change
- Scalability and Growth
- Improved Collaboration and Efficiency
- Minimised Risk of Systemic Failures
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WINDUP

Modular Mastery

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Summary

1. Focus on Business Systems and their Information Systems
2. Move from Separate Systems to Hybrid Systems
3. Apply best practices of Software to Hybrid Systems
4. Reap the benefits of Modular Mastery!

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Modular Mastery Take-Aways

1. Decompose businesses into hybrid business systems based on **cohesion & coupling**
2. **Hide information and operations** inside hybrid systems like we do in software systems
3. Have **clear and well-defined interfaces** for the use of these hybrid systems
4. **Prefer asynchronous interfaces over synchronous interfaces** for hybrid systems
5. **Prefer choreographed over orchestrated processes** for hybrid systems

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High-Level Take-Aways

1. Analyse and Design Business Systems more like Software Systems
2. Focus on Hybrid Business Systems, not separate Human & Software Systems

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"Be more like HR and IT!"

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Thank You!

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