# Introduction to OS Mini-Track for the Enterprise Ecosystem: Extending and Integrating Technology Serving the Enterprise

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## Abstract

*This introduces the HICSS-55 2022 mini-track on the Enterprise Ecosystem: Extending and Integrating Technology Serving the Enterprise within the major track of Organizational Systems and Technology. This track studies the continued evolution and expansion of the integrated enterprise and its complex systems. These papers address the enterprise continuing to seek higher integration and performance, as business demands greater diversification and agility. This year's mini-track presents papers in three different sub-areas of the ERP framework by Grabski, Leech, and Schmidt [1]. These areas are addressing ERP critical success factors (CSF) in business processes, CSF in post implementation and when organizational impact requires ERP evolution. This year's papers address cloud computing support of broad IoT spans, the complexity of M&A companies evolving two mature ERP's to interoperate, and the use of fuzzy logic methods to investigate ERP in the SME manufacturing sector. The track continues to link research with business practice.*

## 1.Enterprise Ecosystem Track Overview

The enterprise ecosystem has evolved and expanded greatly since the initial explosive growth of Enterprise systems in the 1990s and 2000s. The last decade has shown the spanning across corporation by inter-organizational integrations along with increased diversity of devices, systems, layers, and third-party services. Today's enterprise often relies closely on external trading partners extensively and desired to quickly implement new services and processes based on leading-edge technology. This presents new challenges and the papers in this track point to three key areas within the contemporary Enterprise Ecosystem: 1) the evolution of an enterprise network to more successfully support the demands of Internet of Things (IoT), 2) the integrated enterprise challenges faced in mergers and acquisitions, and 3) the continued striving for performance in traditional sectors such as small and medium enterprises (SME) manufacturers.

While there is no single path to success when involving multiple organizations, layers of service providers and vendors and evolving technologies, this mini-track strives to provide a forum for continuing investigation and innovation for the integrated enterprise. This track highlights ways that emerging and traditional technologies and systems can better serve the business enterprise. Recent impacts include, but are not limited to: 1) collecting and analyzing Big Data, 2) cloud computing, 3) Internet of Things, 4) blockchain and 5) new computing innovations. Over the last 23 years, this mini-track has been a forum to explore and disseminate insights about the leading influences on extended and integrated enterprise systems. Hence the encompassing mini-track name recently adopted emphasizes and encompasses the entire extended and integrated Enterprise Ecosystem.

## 2. Enterprise Ecosystem Supporting IoT

The year's track includes a paper addressing the IoT and how the enterprise computing structure can evolve to better support the unique nature and extensive performance challenges of the IoT. The researchers, Hamish Sadler, Alistair Barros and Wayne Kelly, authored "Fog and Edge Oriented Embedded Enterprise Systems Patterns: Towards Distributed Enterprise Systems That Run on Edge and Fog Nodes" [2] which addresses the complexity of an enterprise architecture to support an extensive, diversified IoT. The paper highlights the dimensions of enterprise architecture that are key to a successful IoT deployment including: privacy, security, bandwidth challenges, reliability demands for local/regional computing and communication, low latency for real-time communication along support of device mobility. In ERP Framework [1], the paper addresses the area of ERP critical success factors in sub-area of Post-Implementation phases as it covers increased demands brought on as IoT matures. Post-implementation

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research has been lacking and this paper focuses on an important gap of how computing architectures can support broadly distributed, end-point IoT devices.

In this context, rather than processing performed in a centralized enterprise system or on edge devices; fog computing is described as when communication, computing, control, and storage responsibilities are located at intermediate network locations that are not at the edge of the network. Gaining insights by performing a case study of a CRM system implementation and from prior literature, the paper identifies a set of architectural patterns to distribute computing by various layers across a computing architecture. Rather than being limited by traditional mainframe and edge computing approach, diverse IoT requirements call for more options spanning layers including local, regional linking and centralized nodes.

Prior literature [3] has called for refining cloud computing architectures to address this level of distributed device computing and communication demands, along with the importance of addressing risks regarding security, privacy and performance. The authors present eight patterns to provide effective IoT implementations across different needs and requirements. Each pattern is explained by describing the main problem to be solved, the architectural approach as a solution and then providing an example use case. This paper contributes new thinking as how the enterprise ecosystem has evolved to provide a more dispersed mix of computing nodes in a vast communications network to support extensive real-time devices at the user and end-points of a connected enterprise.

## 3. ERP Interoperability in Mergers and Acquisitions

When firms combine through a merger or acquisition, there is a desire for swift and successful integration of existing enterprise systems. Addressing the challenge of bringing two systems together when combining two corporate entities, this paper fits into the ERP Framework [1] category of ERP Organizational Impact, in the sub-area of Evolutionary Changes in ERP Systems. The paper postulates the possibility of addressing ERP system integration based on categories of context and technology, rather than being addressed as a unique one to one integration. It identifies an enterprise interoperability framework with the dimensions of process or data integration focus and of federated or integrated approach.

This study is titled “Mergers and Acquisitions - Elaborating Factors for Enterprise Interoperability in an ERP Context“ [4] Written by Christian Ploder, Rebecca Weichelt, Reinhard Bernsteiner and Thomas Dilger, this paper addresses a primary implementation challenge encountered when combining corporate entities, that of achieving interoperable and harmonized enterprise systems. The methodology of this mergers and acquisition (M&A) enterprise integration study begins with consulting the literature, performing content analysis, and further validating findings with a set of experts.

Independent of the specific ERP vendor system in use, this research seeks more generalized insights by focusing on the process and data level of ERP interoperability projects. Given the diverse existing systems of two combining company’s, and differing situations (such as long-term integration versus short term improvements before selling off an acquisition) the goals and process of interoperability is highly dependent on the situation. Key is the desired level of integration and those influencing factors are summarized in table 2 of the paper. Looking to the future, the paper identifies the need for increasing flexibility in collaborations (e.g., COVID pandemic breakdown of JIT supply chains). It is limiting to view M&A scenarios as a one on one situation where each company has its own specific processes and data. A broader perspective in future is to consider typifying by generalized characteristics such as viewing as one to many models or even many to many models. This trend may be underway due to greater utilization of cloud computing-based managed services [5] and continuation of inter-organizational standards.

## 4. Ecodynamics for Business Performance

The third paper addresses a primary motivation that has long driven the adoption of enterprise systems, that of improving organizational performance. However, in their paper titled “A Complex Adaptive Systems View of Digital Ecodynamics for Business Performance among Manufacturing SMEs“[6], Ana Ortiz de Guinea and Louis Raymond take an innovative approach to this survey-based research using the method of fuzzy-set qualitative comparative analysis (fsQCA). In ERP Framework [1], this paper addresses the more mature area of critical success factors in sub-area of business processes. It also addresses the call for more levels of analysis as it addresses more generalized organizational capabilities.

Their survey research collected data from a large set of manufacturing SMEs regarding their IT capabilities and business performance. This approach

is taken to avoid what the researchers find problematic in the literature, namely that most IT dynamic capabilities are accessed individually, that configurations of capabilities are not seen as interacting, and that larger firms may not generalize to smaller ones yet SMEs have scant research. Taking a more holistic approach that is grounded in complexity and configurational theory, this paper looks at interconnectedness, mutual causality of capabilities, nonlinearities and causal asymmetries.

Taking a complex adaptive systems approach, the study seeks to identify which configuration(s) of digital ecodynamic elements that achieve (and those that fail to achieve) business performance. In this study, a configuration is a specific combination of causal IT capabilities, dynamic capabilities, and the manufacturing context) that combine leading to an outcome of high business performance. The dynamic capabilities of interest are sensing, learning, coordination and integration. The manufacturing IT capabilities of interest are for innovation, flexibility and integration.

This study of manufacturing SME's finds that such SMEs benefit most from the combination of IT capabilities for innovation, IT capabilities for flexibility along with dynamic capabilities for coordination and integration. Findings supported by theoretical development, include that manufacturing SME's can still attain high business performance when they lack an IT capability and a dynamic capability.

## 5. Enterprise Ecosystem Mini-Track Connects with Industry and Journal

In this mini-track's 23rd year, this track continues actively seeking the involvement and interaction of academia and industry practitioners. This mini-track has two "Fast Track" journal relationships with the International Journal of Accounting Information Systems (IJAIS) for selected articles that contribute to the accounting information systems discipline and with the new journal Data for Good for selected articles using data analysis to address any of the United Nations major advancement initiatives.

## 6. Understanding the Expanding Enterprise Ecosystem

Our thanks to all submitting authors, reviewers and other contributors. We appreciate their contributions and involvement to keep this enterprise ecosystem mini-track current, insightful and of both theoretical and practical value to the extended enterprise research community.

## 7. References


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