

## Accepted Manuscript

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PII: S2213-8463(18)30017-8  
DOI: <https://doi.org/10.1016/j.mfglet.2018.02.002>  
Reference: MFGLET 131

To appear in: *Manufacturing Letters*

Received Date: 14 September 2017  
Revised Date: 22 January 2018  
Accepted Date: 3 February 2018



Please cite this article as: T. Sprock, Self-Similar Architectures for Smart Manufacturing and Logistics Systems, *Manufacturing Letters* (2018), doi: <https://doi.org/10.1016/j.mfglet.2018.02.002>

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# Self-Similar Architectures for Smart Manufacturing and Logistics Systems

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## Abstract

Self-similar architectures simplify design and interoperability for smart manufacturing and logistics systems. Self-similar architectures for these domains extend existing models of self-similar controller architectures to include unified models, or abstractions, of plant behavior and planning and operational control functions. This paper proposes modeling system units as discrete event logistics systems (DELS), an abstraction that unifies heterogeneous system models for the manufacturing and logistics domain. Similar DELS then can be composed into self-similar architectures for larger, more complex DELS.

*Keywords:* Smart Manufacturing, Discrete Event Logistics Systems (DELS), System Modeling, Operational Control

2010 MSC: 00-01, 99-00

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## 1. INTRODUCTION

Challenges in designing and operating smart manufacturing and logistics systems include interaction and coordination between heterogeneous systems, such as material handling systems, storage and retrieval systems, and production systems. Interoperability challenges extend to heterogeneous planning and operational control software

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