

*Are you looking for someone who is both an experienced real-time systems engineer & software engineer, who also specializes in Software Systems Requirements Engineering, Software Systems Architectural Design and Simulation Development as well the application of new processes, new methods, and new technologies to the software system development environment within your organization?*

*Perhaps this is the resume you've been looking for . . .*

***Kent D. Palmer, Ph.D.***

<http://kentpalmer.name>

***Systems Engineer, Software Engineer & Technologist***

"My objective is to find a position of responsibility implementing new technologies within the system engineering and software engineering development process, then to use these technologies to increase productivity and improve system and software quality. The proper use of tools in the development of real-time systems requires knowledge of process, methods, standards, and metrics, combined with development experience. I have a broad range of experience to offer any engineering organization interested in enhancing its real-time embedded technology capability as a way to increase its competitiveness."

See <http://onticity.com> <http://agiletheory.com> <http://scaleagile.com>

# TECHNICAL SPECIALIZATIONS:

- **Real-time Software Engineering**
  - Architectural Design of Real-time Systems
  - Implementer of Real-time Systems
  - Real-time Methodology Expert
- **Systems Engineering**
  - Requirements Engineering
  - Systems Modeling with Formal Methods
  - System Architecture Design
  - Use Case Modeling
  - Systems Traceability
- **Technologist**
  - Agile Software Tools and Methods
  - Systems Engineering Tools
  - Traditional Software Engineering Environments
- **Process Engineering**
  - Scrum Software Development Process
  - Agile, Lean, and Flow Practices
  - Traditional CMMI Process Improvement
  - Six Sigma
- **Agile Transformation**
  - Helping Restructure Organizations for Agile at Scale execution using Leffingwell development approach
  - Helping Product Managers and Product Owners to organize Product Backlogs
  - Helping Scrum Masters facilitate Self-organization of SCRUM Teams
  - Application of Reinertsen Flow second generation Lean principles to large projects
- **Domain Engineering**
  - Domain Analysis
  - Product Line Features
  - Building Domain Specific Languages
  - Design Domain Language research & development
- **Semantic Ontology**
  - Ontology development
  - Semantic Applications using Ontologies
  - Systems Engineering Ontology Research
  - Software Ontological Engineering
- **Systems Science**
  - Application of Systems Theory to Software and Systems Engineering
  - Systems Thinking approach applied
  - Socio-Technical Systems
  - Soft Systems Methodologies
  - Systems Dynamics modeling
  - Continuous, discreet, and queuing Simulations development

# BACKGROUND:

Current Status: Unemployed

\* Major Engineering Controls Company – June 2011 to September 2012 (Contract)  
Software Systems Engineer and Technologist, Process Engineer

*Most recent assignment:*

## **Lead of Agile at Scale process definition effort**

- Produced Agile at Scale and Lean Process architecture based on Leffingwell, Rinertsen, Jacobsen and other sources
- Researched Agile at Scale problem and instituted a Leffingwell based Agile at Scale approach within the organization
- Worked closely with the organization's Agile Mentor and Trainer to align a new process description with Agile, Lean, Flow, Six Sigma training and principles
- Produced a Portfolio level process along with Program and Team level processes that conform to Agile at Scale Standard
- Performed Agile at Scale training within the organization
- Aligned the Agile at Scale process with the ALM toolset using TFS to carry the information of the process rather than documentation
- Solicited feedback about actual practices in organization for adaptation of Process model to the organization
- Reconciled what is actually done within the organization's Agile adopters and what should be done for standards or compliance issues
- Established a Practice based approach with light weight process description
- Elicited Process Policies and Requirements from the organization and adapted the process to the needs of the organization
- Worked out how the organization could converge on a common process without stifling innovation within the teams to produce process variations as needed
- Produced transition strategy between old Waterfall Process and new Agile at Scale process
- Wrote Agile at Scale process descriptions as a starting point for discussions about adaptation to the organization
- Consulted with Agile teams on the introduction of the new process
- Reconciled various standards with Agile and Lean principles within the process such as ISO 9001, FDA, ISO 12207, IEC 61508, and CMMI

*Last Assignment, 1 year*

## **Lead Designer of Team Foundation Server (TFS) platform for Requirements Engineering**

- Designed Requirements, User Story, Task, and other work items for Requirements based on Scrum and Agile models
- Developed an approach to Requirements Management for an Agile Environment.
- Produced Requirements, Design, Developed Prototype Work Items, and developed final version for production use
- Knowledgeable concerning use of Third Party tools that work with TFS with regards to upstream work, for instance, TeamSpec, InteGreat, Urban Turtle, Code Collaborator, Redimine, etc.
- Produced and Delivered Work Item Usage Training
- Developed Deployment Plans and participated in Deployment after TFS Platform Release
- Worked with Developers under Safety and other Regulations to develop a more complete system for the regulated development using TFS
- Developed Process Templates, creating new Work Items, Link Types, Field Types

- Designed a full set of Work Item Templates to cover the entire development process with necessary traceability linkages built in for larger and regulated programs
- Developed Agile/Lean processes and practices
- Assisted in developing an Agile at Scale Development process model, which is being implemented
- Produced recorded classes in Camtasia specific to the tailored TFS environment for deployment
- Worked with an Agile/Scrum team during development as a team member
- Interfaced with Process Group concerning Process/Tool Alignment
- Worked with Agile Coach to develop Agile Practices and to align ToolsSet with Agile/Lean/Kanban development approaches
- Consulted with internal customers concerning Requirements Management and Traceability practices using tools such as DOORS, RequisitePro, Spreadsheets, and TFS to find best the fit for projects, and to inform the design of scalable common solutions
- Helped run Company Wide Requirements Management User Group

Published:

- “The Essential Nature of Product Traceability and its Relation to Agile Approaches” INCOSE 2013
- “Product Owner Agile Systems Engineering Strategies” INCOSE 2013
- “Hacking the Essence of Software” CSER 2013 accepted
- “Reworking the Integral System Engineering Method Domain Specific Languages” CSER 2011
- “Special Systems Theory” Lecture SCPTLS 2011 and ISSS 2012

Written:

- “What are the Principles in Practice: Principled Systems Engineering Practices”
- “Tangled Hierarchies: Encoding and Decoding Turing Machines and Meta-machines”
- “Social Systems Engineering” Accepted by CSER 2012 but not given. Given at ISSS 2012
- “Speculations on Schematic Ontology” working paper for ISSS/INCOSE special session ISSS 2012

Unemployed Jan 2011 to June 2011 -- Exploring business opportunities in Social Media and Smart Phone Apps as well as job hunting

Extensive research in Social Media applications with designs of products produced but not implemented  
 Also research into Smart Phone applications especially for Android with small prototypes designed also not implemented  
 Partial prototypes produced of various solutions  
 Examined the relationship between Social Media and Smart Phone technologies  
 Interested in Real-time aspects of these systems. This research toward product development continues . . .

\* Major Aerospace Company – February 2005 to December 2010

### **Principle Systems Engineer**

*Most recent assignment:*

- Requirements and Verification Systems Engineer**
- Authoring Requirements Verification Reports**
- Setting up DOORS for Requirements Tractability**
- Setting up an Information Consolidation (Wiki) System for Operations Support**
- Performing Requirements Analysis and Tracing**
- Performing Requirements Change Management**
- Attended high level Program Management Reviews to monitor change impacts**

**IR&D on Domain Engineering and Model Based Systems Engineering implementing the infrastructure for a proposal and design center**

### **Systems Engineering Process Lead**

- Improved SE Processes bringing them up to CMMI level 3 maturity confirmed twice by SCAMPI appraisals
- CMMI SCAMPI Appraiser for SE, HW, and SW technical process areas
- Organized and validated evidence to achieve CMMI Maturity Level Three in SE, HW, and SW

- Representative for Systems Engineering on Enterprise Process Group
- Representative for Systems Engineering on Division Systems Engineering Advisory Group
- Lead on AS9100 (ISO) Audit Preparation
- Interface for QA audits of SE Processes
- Interfaced with programs on process issues
- Gave Training on Systems Processes to Systems Engineers
- Reworked Division processes and implemented process changes to align with business

**Second Ph.D. 2009 in Systems Engineering at the Defence<sup>1</sup> and Systems Institute ([DASI](#)) program at the University of South Australia; Thesis title: Emergent Design.**

<http://arrow.unisa.edu.au:8081/1959.8/74458> See also <http://emergentdesign.net>

Published:

- “An Application to Systems Engineering of a Framework of General Schemas Theory” CSER 2005
- “Exploring Intelligent Enterprise System Limitations” INCOSE 2007
- “The Evolving Joint Perspective and Meta-systems Theory: A Case Study based on the Joint Vision Document” INCOSE 2007
- “Emergence and Complexity in relation to General Schemas Theory” CSER 2008
- “The Failure of Systems Engineering as an approach toward Complex Adaptive Systems in our major Customer’s Eyes: Analysis of the Capstone Concept for Joint Operations and its relation to Meta-systems Theory” CSER 2008
- “Self-\* Systems and Special Systems Theory” LA INCOSE MiniConference 2009
- “Systems Radio Podcast Launch” LA INCOSE MiniConference 2010; See <http://systemsradio.net>

Written:

- “Autonomic Computing and Special Systems Theory”
- “Ontological and Knowledge Emergent Engineering of Systems and Meta-systems based on General Schemas Theory”
- “Radical Knowledge Discovery and Emergence”
- “The Ontology of Design”
- “A Critique of SysML from the point of view of General Schemas Theory”

\* Raytheon -- June 1999 to February 2005

**Principle Systems Engineer**

*Most recent assignment:*

**Systems Engineer for Radio Networks**

**Proposal**

**IMS development, Risks and Assumptions, Software Thinspecs,**

**WBS and Scope Documents, interface with Supply Chain Management**

**Radio Network Host Development Manual Update**

Systems Engineering Process Improvement at CMMI Level 3 moving toward CMMI Level 5

Systems Engineering Process Development and Deployment

Project Systems Proposal Activities

Systems and Software Engineering Process Appraisal based on CMMI

(helped attain SE Level 3, then two practices short of SE CMMI Level 5, December 2003)

Six Sigma Certified Specialist (Green Belt with Black Belt classes)

Systems Engineering and Software Engineering

Process Improvement

Project Reporting Improvement

Process Guidelines development

Process Liaison with Projects

Methods Consulting

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<sup>1</sup> Australian Spelling

Process Architecture Development  
Process Directive Development

Trained CMMI Assessor

Trained Integrated Process Development System Deployment Specialist  
Integration of Software and Systems Engineering Processes for OPF, OPD, OID  
(Helped attain Level 5 in SW CMMI, December 2003)

Coordination with Program Management concerning SE ROM bids and SE proposals  
*Systems of Systems* Methods and Process Research

**Developed and delivered a course on: Software Requirements and Architectural Design Methodologies at the local University of California Irvine Extension (Fall 1999)**

Published:

“Meta-systems Engineering” INCOSE 2000  
Also several papers on Meta-Systems Theory at ISSS 2000  
“Anti-Terror Meta-systems Engineering” INCOSE 2002  
“General Schemas Theory” CSER 2004

For these and other papers see <http://archonic.net>

※ Boeing -- September 1985 to June 1999

**Software Engineer and part time Systems Engineer**

**Specializing in Real-time Embedded System Design & Ada/C Implementation**

**Focused on Architectural Design, Software Requirements, and also Simulation development**

*Last Major assignment:*

*Team Leader for both Systems and Software Requirements as well as Software Architectural Design, and then Software Developer for Detailed Design, Code, and Test on a Satellite Sensor Payload System*

**Other areas of competence . . .**

Software Project Team Leader  
Architectural Designer using Real-time and Object Oriented Methodologies for Software Engineering  
Requirements Analyst for both System level and Software level requirements  
Object-oriented Simulation Design & Implementation  
Practitioner using Formal Requirements Methods for Systems and Software Engineering  
Software Process and Systems Process Consultant and Technologist  
Design Methodology Research and Tool Development  
Formal Requirements Methods Research and Technology Transfer  
Human Interface Software Design & Prototyping  
Former Software Engineering Process Group Chairman, Process Assessor and Change Agent  
Lead in Software and Systems Engineering Process, Methods, and Tools development and implementation  
Technology Transfer Specialist

## **PREVIOUS EXPERIENCE:**

\* Creative Micro Systems -- February 1984 to June 85

Computer Manufacturer

**Lead Real-time Software Engineer / Project Manager**

Principal designer on a 12,000-line real-time system written in Assembly code.

\* ATV Systems -- January 1983 to January 84

Computer Manufacturer of Restaurant Point-of-Sale  
and Hotel Front-Desk Systems

**Systems Analyst**

New product development for hospital industry.

\* Word Management Systems -- 1979 to 81

Word Processing Bureau -- Norwich, England

Managing Partner (Part-time student)

**First Ph.D. 1982 in Sociology at the London School of Economics, University of London**

**Full-time graduate student -- 1973 to 1982**

**Ph.D. degree obtained 1982**

**Subject: Philosophy of Science**

Dissertation Title:

The Structure of Theoretical Systems in Relation to Emergence.

Dissertation analyzed the impact of new things coming into existence on the structure of scientific theories.

University of Kansas -- 1969 to 73

Full-time undergraduate student. Graduated with two majors. Sociology Honors and East Asian Studies.

## ESSENTIAL SKILLS:

- Agile at Scale Process Designer and Implementer based on Leffingwell development model
- Reinertsen Flow second generation Lean development principles
- Technologist and Tool developer for Agile/Lean processes using Team Foundation Server
- Design and Development of a Requirements Management solution in Team Foundation Server
- Requirements and Verification Systems Engineer
- Real-time embedded software systems design, prototyping, and implementation.
- Object-oriented simulation design and development
- Software and systems engineering process definition
- Engineering-wide work process architecture development
- Research into Systems Engineering and Software Engineering Processes, Methods, and Tools
- Research into Formal Requirements Methods
- Research into Domain Engineering and Model Based Systems Engineering
- Research into Design Methodologies
- Project planning and project leadership
- Development of software engineering technology applications such as CASE tool design and prototyping and environmental integration
- Trained at Software Engineering Institute, Pittsburg, PA to perform appraisals of software development process execution
- Performed audits of division Systems, Hardware and Software process using Capability Maturity Model Integrated (CMMI) according to SEI SCAMPI assessment methodology
- Performed audits of division Software process using Capability Maturity Model (CMM) according to SEI assessment methodology
- Studies of methodological issues such as the application of the object-oriented methodology to the analysis and design of real-time systems
- Studies of the application of Domain Specific Languages at the Systems Engineering level
- Development and maintenance of databases and models for productivity and quality analysis
- Research into use of new technologies, technology infusion and transfer to early adopters
- Principal evaluator for many engineering tools
- Planning and execution of technology enhancement programs
- Contact for technology transfer from aerospace consortia, e.g. SSCI(SPC), SEI, and SPIN

# EXPERIENCE:

## SYSTEMS ENGINEERING:

### Systems Engineering Requirements and Verification on Satellite program

*Requirements Change Management, Requirements Management in DOORS, Requirements Verification*

Developed Wiki architecture to support operations  Participated in Change over from Teamcenter (SLATE) to DOORS  Integration of various databases into a central repository  Merged various separate Change Management processes into a single unified process  Audited Milestone Reviews to make sure that all the products that were to be complete were accounted for.  Attended Program Management Meetings at all levels of the program.  Analyzed Change Packages for correctness and cost impact  Wrote Requirements Verification Reports.

### Systems Engineering IR&D on Satellite Ground Systems

*Developed Processes and Methods for Constellation Control Prototype Development.*

**Key development systems engineer working to integrate prototypes to produce ground system of the future.**

Worked with lead systems engineer to plan and implement coordination tasks.  Coordinated the work of several systems engineers and various organizations to make the project come together.  Worked with vendors closely and supervised their efforts.  Produced novel approaches to the design task of the IR&D.

### Systems Lead on Satellite Payload Processor

*Organized Systems Engineering effort on major project.*

**Collected issues and analyzed their project impact.**  Facilitated cross discipline resolution of issues on project.  Advocated model building at Systems Engineering level.  Brought focus to areas of concern.  Forced changes in specifications in order to improve Systems Engineering discipline on the project.

### Systems Engineering Process Development and Deployment

*Focal point for SE Process Maturity improvement.*

**Helped the SE process owner to develop a process improvement strategy and implement it within the organization.** Assessment of SE Process using EIA 731.  Six Sigma Baselineing.  SE project reporting improvement.  Developed Process Guidelines.  SE process intraweb Requirements and Design.  Active Liaison with SE projects on process related issues.  SE related Fact finding concerning effort and cost.  Template development.  Process Tailoring Checklist development.  Example Discovery and diffusion of Best Practices.  Process Architecture development.

### Systems Process Methods and Tool Research

*Have been practicing Systems Engineering based on recent research into Systems Processes, Methods, and Tools attempting to put these improvements into practice by example use.*

**Solid Theoretical Background in Systems Science**  Developed Systems Engineering Processes  Research in Formal Requirements Methods at Science Center  Focused on integrating Software and Systems Capabilities  Applied Systems Engineering Processes and Methods to Research Prototypes under development.

## SOFTWARE ENGINEERING:

### Software Requirements, Architectural Design and Implementation of Satellite Sensor Payload System:

*System has two PowerPC processors and 40 C40 Digital Signal Processors and contains Five CSCIs.*

**Helped setup processes, methods and tools for project.**  Collected software requirements and wrote SRS.  Produced Behavioral Model of system using Gurevich Abstract State Machines Method.  Produced DARTS Tasking Architecture and wrote SDD.  Produced ObjecTime model of application.  Represented Software Team at Systems Engineering meetings.  Coordinated with hardware designers.  Supervised update and coordination of all Software Design models.  Worked to apply latest technology, methods, and processes to project to achieve maximum efficiency  Produced module designs  Wrote and tested C code for a significant part of the payload system using VXworks Tornado.

### Simulation Development:

*Knowledge of object-oriented discrete event and continuous system dynamic simulation systems.*

**Wrote simulation with dynamically programmable attributes that modeled multiple vehicle interaction scenarios.**  Simulation designed to drive multiple interactive console displays, keeping information coherent across operator positions.  Simulator written in MODSIM object-oriented, graphical simulation language.  Multiple simulation programs communicating through Unix sockets to user interfaces written in X Windows.  Sensor subsystems emulated

and vehicle design prototyped.  Invocation of Object methods in another program across the network.  Event management through global postoffice where objects register for events.  Continuous simulation facilities built into discrete event simulator.

#### **Implementation Experience:**

*Industrial experience in higher level programming.*

**Designed and implemented Cache in Ada code for large Database project.**  Compared, selected and used Ada compiler and Run-time kernels.  Wrote Ada tasking design descriptions.  Retargeted C prototypes into Ada.  Developed and implemented object-oriented designs using Ada.  Familiarity with C++ and Java.  Dabbled in Ruby, Python, Scala and other languages. Strong interest in Programming Language Design especially in relation to Domain Specific Language implementation and Code Generation

#### **Human Interface Design:**

*Skilled in use of User Interface Management Systems.*

**Created expert system user interface.**  Researched UIMS for real-time systems.  Prototyped user interfaces in various languages.  Developed layered display architecture.  Designed object-oriented prototyping tool.  Prototyped hypertext diagnostic system.

#### **Software Reuse:**

*Adept in Software Reuse Technology.*

**Developed software reuse plans.**  Performed Domain analysis.  Set up reuse library.  Researched design reuse methods.  Developed feasible reuse process.  Constructed reusable parts.  Used SPC Synthesis methodology.

### **SOFTWARE TECHNOLOGY:**

#### **Requirements Methods:**

*Research into Formal and Semi-formal Methods.*

**SPC CoRE, Software Cost Reduction, Parnas' Four Variable Method, Gurevich Abstract State Machine (ASM) Method, N. Leveson's RSML, Statemate, SRI's Prototype Verification System, Z, VDM, RAISE**  Compared different Formal Methods in terms of Engineering usability  Produced Studies of use of Gurevich ASM on example problems  Taught Gurevich ASM based on Borger's book Abstract State Machines: A Method for High-Level System Design and Analysis  Applied ASM on Pilot projects to test usability on real systems  Championed ASM in multiple organizations as the best semi-formal requirements engineering modeling method

#### **Requirements Engineering Technologist:**

*Developed Advanced Requirements Engineering solution based on Team Foundation Server*

**Developed Requirements, Designed and Implemented Full Lifecycle support of Agile/Lean development using TFS work items**  Wrote User Guides and Documentation of System.  Developed and Delivered Training for Work Item Usage  Worked with vendors to produce integrated and scalable solution using TFS add-on products  Worked with users to discover needs and turned these into system requirements  Did deployment Planning and execution for the released system

#### **Real-time Design Methodologies:**

*In-depth experience using many methods in design work.*

**Architectural and detailed software design.**  Programming-in-the-large and Information-hiding.  Distributed & Tasking-communication design.  Object-oriented & Functional design.  Designs for applications using Real-time Operating Systems such as VXworks from Wind River Systems

Some specific methods: UML  SysML  Jacobson / Cockburn Use Cases  Wisse Metapattern  Data Context Interaction (DCI)  Objecttime/ROOM  Real-time Object Oriented Design Methods  SPC - ADARTS / Gomaa - DARTS  Neilsen / Šumate - OOD/VLM  Constantine / Wasserman - OOSD  Shaler / Mellor - Object Oriented Analysis  Yourdon / DeMarco- Structured Analysis / Design  Hatley / Pirbhai real-time extensions  Ward / Mellor real-time extensions  Gutag / Liskov - Object Oriented Design  Entity-relationship modeling & temporal logic  Object Modeling Technique

#### **Software Work Process Implementation:**

*Put in place a complete software process for development.*

**Chairman of Division's Software Engineering Process Group (SEPG).**  Created conceptual framework for process improvement activities of the division.  Defined and implemented software processes.  Delineated Division's software procedures.  Developed process and product metrics.  Designed information collection methods.  Assessed projects using SEI process Capability Maturity Model and questionnaire.  Developed ADARTS based process for Design.  Instituted use of Architectural Design Plans.  Wrote Systems Engineering work process based on MIL-STD-499B.  Researched, Architected and Wrote Agile at Scale Process

#### **Cost Estimation Parametrics:**

*Estimated software size, effort & schedule for bids.*

**Built historical productivity database.** □ Calibrated SOFTCOST model. □ Created custom in-house models based on regression and COCOMO parameters. □ Coordinated cost model comparisons. □ Applied models to make bids in proposal efforts. □ Created work breakdown structure models. □ Made cost and schedule estimates. □ Analyzed engineering bids, and compared them to model results to identify cost drivers. □□

□ **Environment Building:**

*Constructed a unified environment for development.*

**Evaluated Computer Aided Software Engineering tools.** □ Integrated software design environment. □ Planned technological insertion of environmental capabilities. □ Trained Software Engineers on tools and methods, and developed associated documentation. □□

## Other works:

- "Integration of Methods in Software Architectural Design: Towards the definition of a Core Set of Real-time Design Methods" (SES II & CASE88)
- "Software Engineering Foundations: A Paradigm for Understanding Software Design Methods" (SES III)
  - Part 1: Software Ontology
  - Part 2: Software Systems Meta-methodology (SES IV)
  - Part 3: Integral Software Engineering Methodology (SES V)
- "The Future of Software Process" (SES V)
- "Software Engineering Design Methodologies and General Systems Theory"  
International Journal of General Systems - Vol. 24, No. 1-2, 1996, pp. 43-94
- "Steps to the Threshold of the Social" (SES VI) Series of working papers.
- "Advanced Process Architectures" Tutorial SEPG National Convention 1995.
- "Meta-Systems Engineering" Tutorial for Principles Working Group INCOSE 1997.
- "Reflexive Autopoietic Dissipative Special Systems Theory" 1999.
- "Gurevich Abstract State Machines in Theory and Practice" 2000.
- "Vajra Logic and Mathematical Meta-models for Meta-systems Engineering" INCOSE 2002.
- "Possible Grounds For A Reflexive Sociology" 2003
- "Working papers on the Foundations of Systems Engineering Methods"

See <http://archonic.net> and <http://holonomic.net>

Curriculum Vita at [http://works.bepress.com/kent\\_palmer/](http://works.bepress.com/kent_palmer/)

## **Personal Data:**

- o U.S. Citizen.
- o Will consider relocation.
- o References will be supplied upon request.

## ***Contact:***

### **Kent D. Palmer**

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