

**Kent D. Palmer, Ph.D.**  
**Technical Specializations and Capabilities**  
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### **Real-time Software Engineering**

After I completed my first Ph.D. I began my career working for a small company as a Systems Engineer and then moved to Boeing (which was then Rockwell International) and continued as a real-time Software Engineer in Marine Systems, Missile Systems, Satellite Systems, and Ground Systems. I worked on a few large command and control systems written in Ada, but then specialized in retargeting smaller device oriented systems with their own processors that mixed operating systems with applications to work on VXworks separating out the applications from the operating system and modernizing the embedded computational devices whether they were controllers, actuators or sensors. These systems were written in C.

- **Architectural Design of Real-time Systems**  
I became very interested in the design of real-time systems and wrote various papers on real-time design methods based on my experience creating architectures for real-time systems.
- **Implementer of Real-time Systems**  
These systems were written in C within a VXworks environment, or some other real-time operating system.
- **Real-time Methodology Expert**  
I became an expert in the design of real-time systems, using state of the art methodologies and worked to become a methodologist in order to help others to learn how to design real-time systems.

### **Systems Engineering**

I moved from Software Engineering into Systems Engineering and worked on various projects as a Systems Engineer, bringing Software Engineering expertise to bear on many different problems. I pursued and received my Ph.D. in Systems Engineering, which can be seen at <http://about.me/emergentdesign>

- **Requirements Engineering**  
My very first job as a Systems Engineer focused on collecting requirements for 'point of sale' systems and medical systems, although the demands of my job eventually shifted toward Software Engineering. However, later in my career at Raytheon and then at Northrop, I practiced Systems Engineering again on projects, mostly concentrating on the Requirements and Architectural phases.
- **Systems Modeling with Formal Methods**  
I spent one year at the Rockwell Science Center learning Formal Methods for Software Engineering, eventually narrowing in on Gurevich Abstract State Machines as the method of choice. These were applied to small problems offered by the divisions. Upon my return to Anaheim I applied this method to a Satellite System I was working on with good results.

- **System Architecture Design**  
My interest in Software Design led me to get involved with Systems Design after I became a Systems Engineer on several proposals, not as lead System designer, but helping the lead Systems designer with the software aspects of the Systems being proposed. This led me to focus my Ph.D. research efforts on Architectural Design (in general) rather than merely concentrating on Software design.
- **Use Case Modeling**  
I have been a proponent of ‘usecase’ requirements specification and now have become a proponent of DCI design method, which is based on usecases.
- **Systems Traceability**  
I have worked to improve traceability throughout the ‘lifecycle’ and I have developed a method for doing traceability among requirements, functions, components, and tests with crosslinks as the trace structures.

### **Technologist**

I have a strong interest in improving Software Technology by introducing new tools, methods, and processes.

- **Agile Software Tools and Methods**  
I developed a Team Foundation Server implementation which adapted work items and process templates for use by developers to fit company needs. I also worked to help introduce Agile methods to teams.
- **Systems Engineering Tools**  
I am proficient in the use of DOORS (being trained as an administrator), have familiarity with CORE and Systems Architect, Rational Rose, and other dedicated Systems Engineering tools as well as UML and SysML diagramming languages.
- **Traditional Software Engineering Environments**  
I put together and trained the first software engineering environment in the early 80s at Rockwell, and then worked with various consortia and vendors to introduce Methods and Tools for real-time software engineering to a campus of over 2000 software engineers. Since then I have continued to work in varied software engineering environments while continuing to improve tools and methods as well as processes.

### **Process Engineering**

I was charged with CMM and CMMI process work to be applied as a technology for improving software development and headed efforts to achieve higher maturities in both Software and Systems at various companies

- **Scrum Software Development Process**  
I trained as a Certified Scrum Master and a Certified Product Owner through Mike Cohn’s course in February 2013. Worked as an Agile Coach before that with Scrum Masters and Product owners as well as Managers.
- **Agile, Lean, and Flow Practices**

I learned to apply Agile and Lean practices to projects in my role as an Agile Coach under the direction of the Senior Agile Coach of the company and helped him to solve process problems. I introduced the concept of using ‘practices’ instead of processes from the works of Ivar Jacobsen.

- Traditional CMMI Process Improvement  
I took Boeing (Rockwell) to CMM level 3 in software, then Raytheon to maturity level 3, and then level 4 in Systems Engineering. I led the effort to take Northrop Grumman to level 3 in Systems Engineering twice.
- Six Sigma  
Green Belt in Six Sigma with most Blackbelt classes taken, but no Blackbelt project completed.

### **Agile Transformation**

I became interested in Agile and Lean approaches, especially the Scrum framework, after leaving Aerospace. I have written several books and articles on Agile and Lean practices based on Complex Adaptive Systems Theory.

- I helped to Restructure Organizations for Agile at Scale execution using the Leffingwell development approach at a commercial company after leaving aerospace.  
I also introduced the Leffingwell SAFe model and helped them attempt to institute release planning on large projects, as well as institute Program Management Scrum teams with backlogs.  
Researched Portfolio level organization approaches.
- Helped Product Managers and Product Owners to organize Product Backlogs  
Compared how different large projects were doing their product backlogs at the higher levels of abstraction and worked to get them to use similar techniques.
- Helped Scrum Masters facilitate Self-organization of SCRUM Teams  
Helped to introduce ‘Scrum of Scrums’ and other higher level coordination groups in large teams.
- Application of Reinertsen Flow second generation Lean principles to large projects  
Worked to implement the principles of Second Generation Lean into the practices of large projects that were applying the SAFe model.

### **Domain Engineering**

I have a strong interest in Domain Engineering and have been developing Domain Specific Languages (DSLs) and techniques for Domain Engineering at different companies over many years.

- Domain Analysis  
Used Domain Specific Languages for the design of systems.
- Product Line Features

- Developed Product Line models for Software Reuse
- Building Domain Specific Languages  
Developed domain languages for expressing designs and also helped to develop design languages for various disciplines that integrate various satellite subsystems.
- Designed Domain Language research & development  
I have an on-going research project developing Domain Specific Language technology with rich semantics for Architectural Design, which was presented at the CSER 2010 conference.

### **Semantic Ontology**

My research into Ontologies goes back to my first Ph.D. when I studied Ontologies and their relationship to the Scientific Method and Ontology's place in the Scientific tradition.

- Ontology development  
Developed Ontologies for Systems Engineering discipline
- Semantic Applications using Ontologies  
Used Semantic techniques to develop fault tolerant systems and to do reliability reporting.
- Systems Engineering Ontology Research  
Developed domain languages for expressing designs and also helped to develop design languages for various disciplines that integrate various satellite subsystems.
- Software Ontological Engineering  
Developed Ontologies for Software Design incorporated into Design Language Design.

### **Systems Science**

Over many years I have pursued research into the development and advancement of Systems Theory and have presented papers on the subject at multiple conferences.

- Application of Systems Theory to Software and Systems Engineering  
Wrote papers applying Klir's Formal Structural Systems Theory to Software Engineering Design.
- Systems Thinking approach applied  
Strong advocate of Systems Thinking approach and understanding systems according to principles of Systems Theory which is part of Systems Science.
- Socio-Technical Systems  
Developed approaches to Software based on Socio-technical systems
- Soft Systems Methodologies  
Used Checkland's Soft Systems Methodology
- Systems Dynamics modeling  
Used Systems Dynamics Modeling to model software development process
- Continuous, discrete, and queuing Simulations development  
Produced Discrete and queuing Simulations various processes.

I developed a solid foundation in the Philosophy of Science based on my Ph.D. research at LSE on the Philosophy of Science in the Sociology Program at London University. I became interested in Systems Theory as I wrote my dissertation titled The Structure of Theoretical Systems in Relation to Emergence (how new things come into existence producing discontinuities in the tradition like Kuhn's Paradigms and Foucault's Epistemes). Toward the end of my studies I set up a Word Processing business in Norwich, England to support myself, but also to have access to a Word Processor to complete my dissertation. I was introduced to Micro-computers during that time and began using them to build simple simulations during the last part of my Ph.D. studies. Upon my return to the U.S. I was hired as a Systems Engineer doing requirements for Point of Sale Systems and Medical Information Systems by the company that made the Word Processors and Micro-computers that I had been using in England. After leaving that position I took a job as a Real-time System Designer for a small company and designed a time keeping system that was written in assembly code. After that job was finished I found a job as a Technologist for Rockwell International (Boeing) and began my Aerospace Career.

In my Aerospace career I worked as a Real-time software engineer for at least 14 years developing real-time systems as well as working on several large Ada programs. The real-time systems were mostly in VXworks using C. I had two years working in a Design Lab programming simulations for submarines using an Object Oriented language based on Modula called ModSim that had simulation features built in. During this time I would also do technology work of various kinds introducing new tools, methods, and processes. I led the effort to produce CMM processes and to deploy them and then helped to work to elevate the site to CMM level 3 in software. During this time I was a lead Software Engineer on a Satellite program and introduced new methods and tools to that program such as Gurevich ASM and Objectime after learning about these tools and techniques for a year working at the Rockwell Science Center doing research in Formal Methods.

After the Satellite program was terminated I spent some time developing Satellite ground systems, and then transitioned to Raytheon as a Systems Engineer. I worked on projects as a Systems Engineer and also led the effort for them to reach CMMI maturity levels 3 and 4 in Systems Engineering. During this time I did a lot of course instruction in Software related subjects. I also taught a course in Software Requirements and Design at UCI extension. Following that work I transitioned to Northrop Grumman where I led a team of engineers to reach CMMI level 3 twice in Systems Engineering, as well as working as a Systems Engineer on various projects.

After leaving Northrop Grumman I became a contractor with a Company that was implementing Agile at Scale. I was hired to help them with their Software Requirements problems and to design the work items for the Team Foundation Server adaptation. But during deployment it became obvious that they needed process help, so I began working with their Agile Coach to solve organizational process problems, and ended up doing research that led to the introduction of the

Leffingwell SAFe model. I then helped scrum masters, product owners, and managers adapt to the release planning and product management parts of the SAFe model. I also introduced using *practices* instead of processes, and eventually rewrote their organizational procedures into an Agile process using 'kinds of work' and reduced their process load by at least 70%. After that contract ended I had another contract with a leading Agile Consulting company that was working on Agile at Scale projects and got to see how they were approaching those projects. I developed a theory of how Agile at Scale should be implemented and I have written several books on Agile, Lean, Scrum and Agile at Scale. These include Agile Theory, The Foundations of Agile Teaming, Lean Agile Systems Engineering and finally (in progress) is a book on the foundations of Agile-Lean Scaling transformations.

### **Capabilities**

I have a broad knowledge of Software Engineering and Systems Engineering and have done extensive research into these disciplines over the years as well as having experiencing in them working on programs. I have a Ph.D. in Systems Engineering that focuses on the foundations of Architectural Design and Systems Engineering foundations. I have worked in Requirements Engineering at both levels: Architectural Design at the Software and Systems level and Implementation of Real-time Systems including leading a software team that worked on building a satellite controller. I have worked in Marine Systems, Missile Systems, Satellite Systems, and Ground Systems.

I have helped organizations improve their processes in CMM and CMMI and led the projects that took them to higher levels of maturity in both Software and Systems Engineering. I have learned Agile and Lean approaches and applied them not only on a project, but also at scale in an organization that was undergoing Agile at Scale transformation. I have given multiple presentations on Agile At Scale frameworks such as SAFe and have developed my own approach.

I have been engaged in research over the years in ontological engineering based on early studies of Systems Theory and Ontology that has continued throughout my career leading to a research program in Domain Specific Languages especially for Software and Systems Architectural Design.

I have written many papers and books on Software Design, Systems Theory, Ontology, Agile and Lean theories, and Agile at Scale transformation as well as many other subjects of interest, and have presented multiple research papers at INCOSE.org, CSER and ISSS.org conferences.

I am oriented toward solving the development problems in Software and Systems Engineering by introducing new technologies, tools, methods, and processes which are the cutting edge within these disciplines. I have been engaged in 'hands on' development of systems throughout my career but particularly when I worked as a real-time Software Engineer for Boeing. After that, I concentrated on higher levels of abstraction and the problems of Systems Engineering throughout the lifecycle. I

have been engaged as an interface between Software and Systems engineering disciplines within various organizations from both sides of the discipline divide. I was one of the first Software Engineers to become a Systems Engineer at some of these companies.

I bring cutting edge and active research into Software and Systems tools, methods, and processes to help solve actual problems in development and production environments. This research is based on broad knowledge of Science and Technology, but also focuses on Software and Systems Architectural Design as a key part of the development process with experience in Requirements and Implementation and some experience in test as well as verification and validation. I am a strong advocate of Agile and Lean methods, as well as the Scrum framework and have been an Agile Coach for some time in at least one organization which had moved into an Agile at Scale transformation. I introduced using practices rather than processes as well as the Leffingwell SAFe approach to organizing large projects within the R&D organization.

**Notes**

US citizen

Can work at any company in the US

Will not need any visa sponsorship

Will travel 10% of the time

Will Relocate