

# **Agile and Lean SE: Are these two approaches complementary or they are different and should be applied in specific environment?**

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**Abstract.** Systems Engineering processes, methodologies and tools are used for developing and engineering complex and challenging systems. Our main goal is delivering the right system at the right time in a competitive price for the customers. There are several approaches to improve the Systems Engineering processes. Among these approaches we will focus in this panel on only two popular approaches—the Lean and the Agile Systems Engineering. During this panel we intend to describe the main characteristics of the two approaches, and we intend to discuss the commonalities and the differences of the Agile SE and the Lean SE. Also, we will form a debate on the interesting question: Are these two approaches complementary or they are different and should be applied in specific environment? We are sure that it is crucial to inform managers and engineers about the differences between the Lean and Agile approaches, so they can apply in their case/project the most relevant approach, which fits their specific environment. Ultimately, it can be argued that both approaches strive to maximize customer value. Both approaches value the people executing the program, and optimize the program processes. The most significant difference between the two approaches is that while the Lean approach stresses a clear up-front definition of customer needs and requirements, and optimizes processes and organization to deliver that value, Agile approach stresses responsiveness to changing customer requirements. It seems that these two approaches are dealing with two different situations—The Lean is striving to more efficient processes and organization, and the Agile is promoting more effective processes by early, continuous and frequent of valuable deliveries to the customers. Also, we may claim that the Agile approaches fit the product development stages, and the Lean approaches may fit the production & implementation stages.

## **Biography**

**Avigdor Zonnenshain (RAFAEL)** - [avigdorz@rafael.co.il](mailto:avigdorz@rafael.co.il)

Dr. Zonnenshain is a Ph.D. for Systems Engineering from the University of Arizona, Tucson. Currently, he is Senior Research Associate and systems & Processes Engineer at the Ordnance & Protection Division of RAFAEL. Formerly, he holds several major positions in the quality and Systems engineering arena. He is an active member of the Israel society for quality (ISQ). He is the leader of the assessment team for the National Quality Award for Industry. He is the chairman of the standardization committee for management & quality. He is active in the community as the chairman of steering committee of RAFAEL for Social Responsibility. He is an active member of INCOSE\_IL by chairing several National Conferences for Systems Engineering, by leading several of its committees and by publishing a lot of professional papers. Also, he is an active member of INCOSE by being highly involved in the International Conferences and several Working Groups. He was elected an INCOSE Fellow in 2010. He is a senior lecturer in the Technion, the Israeli Technology Institute. He is guiding students for higher degrees in quality, management & Systems Engineering. He is an active member of Lean SE WG & is leading in RAFAEL several systems engineering & project management processes improvements based on the lean principles.

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Prof. Bohdan 'Bo' W. Oppenheim - Professor of Systems Engineering, LMU|LA, Prof. Bohdan Oppenheim-Bohdan 'Bo' W. Oppenheim is a Professor of Systems Engineering at LMU in Los Angeles. He is the founder and Co-Chair of the Lean Systems Engineering Working Group of INCOSE, co-leader of the effort developing Lean Enablers for Systems Engineering, author of the book Lean for Systems Engineering with Lean Enablers for Systems Engineering and the second author of The Guide to Lean Enablers for Managing Engineering Programs. His engineering degrees include: \_ Ph.D. from Southampton, U.K.\_ Graduate Engineer's Degree from MIT\_ MS from Stevens Institute of Technology\_ B.S. (equiv.) from Warsaw University of Technology in Aeronautics. His credits include five books, 20 journal publications, \$2.5 million in externally funded grants, and a 30 year industrial experience. He is the co-recipient of 2011 Shingo Award, 2010 INCOSE Best Product Award, and recipient of 2011 Fulbright Award, and 2008 LACES Best Teacher Award.

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Rick Dove was co-PI on the original work which identified Agility as the next competitive differentiator, funded by the US Office of the Secretary of Defense through the Navy in 1991 at Lehigh University. He went on to organize and lead the US DARPA-funded industry collaborative research at Lehigh University's Agility Forum, developing fundamental understandings of what enables and characterizes system's agility. He authored Response Ability \_ The Language, Structure, and Culture of the Agile Enterprise (Wiley, 2001). He has employed these agile concepts in both the architecture and program management for large enterprise IT systems, for rapid manufacturing systems and services, and for highly distributed resilient network zero-day intrusion detection. Through Stevens Institute of Technology he teaches two 40-hour graduate courses in basic and advanced agile-systems engineering and agile systems at client sites. He chairs the INCOSE working group on Agile Systems and Systems Engineering, and the INCOSE working group on System Security Engineering. He is CEO/PI at Paradigm Shift International, which provides agile architecting, and project management services, and contracts to US government agencies to investigate and produce agile security technology.

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Hillary Sillitto graduated in Physics from St Andrews University in 1976, and started his career in Edinburgh as an optical engineer. He moved to Thales Optronics in Glasgow in 1993, and subsequently held appointments as Chief Systems Engineer and Chief Engineer. Seconded to Thales UK Corporate in 2003-4 as Engineering Director Prime Contract Support, he made important inputs into major bids and programmes including Soldier Systems, Aircraft Carrier, UAV and C2 systems, and led the development of the Systems Engineering part of the Thales Prime Contract Management Handbook. From 2005 to 2008 he was seconded to UK MOD as head of the Integration Authority, responsible for managing system-of-systems interoperability across the whole scope of the MOD's acquisition programme and promoting the development of systems engineering skills and culture in the acquisition organisation. He then became the Chief systems Architect for Thales Land & Joint Systems Division in the UK. He is now Systems Engineering Director of Thales UK, and represents Thales UK on the Thales Group systems engineering board. He has been a member of INCOSE since 1996. He was elected an INCOSE Fellow in 2009, certified an ESEP in February 2010, and was an INCOSE-nominated BKCASE author.

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Uzi Orion currently is Director for Technology Initiatives and Development at ELBIT SYSTEMS Electro-Optics - ELOP, located in Ness Ziona, Israel. ELOP is a leading manufacturer of military Electro-optics equipment. His former positions at ELOP were Chief Engineer and Chief Systems Engineer. Mr. Orion holds a BScEE degree (summa cum laude) from Ben Gurion University in Be'er-Sheva, Israel. Mr. Orion has vast experience in many engineering fields, including video processing & communication for the Israeli Air Force, development of advanced military communication instruments for Motorola Israel. He held a variety of functions at ELOP, including establishment and development of a world class level technical specialty groups, leading of professional groups, management of military Electro-Optics projects including Laser systems, fire-control systems for tanks, advanced displays, space systems as well as managing the East European marketing desk, and many other positions. Mr. Orion is a former president of the Israeli Society of Systems Engineers INCOSE\_IL and is currently leading the technical activities of the society.

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Mr. Greg Gorman -IBM Program Director World-Wide Systems Engineering Strategy and Delivery. At IBM Greg leads both the strategy and development of both the Rational Solution for System and Software Engineering and Rational\_s Product Line Engineering Solution. Greg joined IBM through the Telelogic acquisition in 2008, where he served in several positions ranging from field engineer to sales executive to Vice President of Product Management over his 20 year history. Prior to joining Telelogic, Greg was with McDonnell-Douglas and then Honeywell Air Transport, where he led software and systems team creating crew station displays for fighter aircraft and commercial jetliners. Greg is a graduate of The University of Missouri and is a Certified Product Manager, AIPMM. Greg also serves as one of IBM Rational\_s thought leaders in the areas of complex systems development and is IBM's Corporate Advisory Board Representative to the International Council on Systems Engineering (INCOSE). He is also active in Scouting (and is an Eagle Scout), mentors a FIRST Robotics team and serves as INCOSE's Associate Director of K-12 Youth Outreach.