

Project Performance International

Systems Engineering

Newsletter (SyEN)

SyEN #022 - July 27, 2010

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<http://www.ppi-int.com/newsletter/SyEN-022.php>

Dear Colleague,

SyEN is an independent free newsletter containing informative reading for the technical project professional, with scores of news and other items summarizing developments in the field, including related industry, month by month. This newsletter and a newsletter archive are also available at www.ppi-int.com.

Systems engineering can be thought of as the problem-independent, and solution/technology-independent, principles and methods related to the successful engineering of systems, to meet stakeholder requirements and maximize value delivered to stakeholders in accordance with their values.

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A Quotation to Open On

"Four models were examined highlighting various issues encountered in the application of these specifications. SysML and UPDM can best be described as emerging technologies" - National Aeronautics and Space Administration, Intelligent Systems Division, July 2010

Featured Article

Thinking in Systems – Aha!

By Alwyn Smit
asmit@ppi-int.com

Having been trained as an engineer and practising systems engineering for a long time, the concept of reductionism is not unfamiliar. This is after all how we deal with complex systems – by breaking it down into individual elements that we can understand and comprehend. Systems thinking has always been the understanding that systems exist within a context that influences their dynamic behaviour and that their behaviour is not only determined by the behaviour of their elements – right? - That was until I read “Thinking in Systems” by Donella Meadows. For me this was what Gene Bellinger calls an Aha! moment on the [Systems Thinking World](#) LinkedIn group.

Meadows defines a system as “a set of things interconnected in such a way that they produce their own pattern of behaviour over time”. Another central insight explained right at the beginning of the book is the relationship between structure and behaviour of a system. A system also has a distinct purpose that is deduced from its behaviour. It is however the interconnections between the elements of the system and between the system and other systems in its context that greatly define its behaviour over time.

In modelling the behaviour of systems, Causal Loops Diagram (CLD) and Stock & Flow Diagrams are quite often used. The existence and impact of feedback loops, either [balancing](#) or [reinforcing](#), is the last essential concept in understanding and modelling system behaviour. These concepts are all very well explained on www.systemswiki.org where all four of the above links will redirect the reader.

For me the highlight of “Thinking in Systems” are the system archetypes that Meadows identify as well as leverage points to intervene in a system. Armed with this basic knowledge one can begin to understand the true value and application of systems thinking. The system archetypes or “System Traps... and Opportunities” as identified by Meadows include:

- Policy Resistance – Fixes that Fail
- The Tragedy of the Commons
- Drift to Low Performance
- Escalation
- Success to the Successful – Competitive Exclusion
- Shifting the Burden to the Intervener – Addiction
- Rule Beating
- Seeking the Wrong Goal

Each of these is discussed by Meadows in the form of a definition, a discussion of typical examples and finally, the way out of the system trap. Below is a summary of the definition and the way out for each archetype. Most of these have also been modelled by Gene Bellinger on www.systemswiki.org and the links to these models are also included.

Policy Resistance or Fixes that Fail

Definition (Meadows): “When various actors try to pull a system stock towards various goals, the result can be policy resistance. Any new policy, especially if it’s effective, just pulls the stock farther from the goals of other actors and produces additional resistance, with a result that no one likes, but everyone expends considerable effort in maintaining.”

The Way Out (Meadows): “Let go. Bring in all the actors and use the energy formerly expended on resistance to seek out mutually satisfactory ways for all goals to be realized – or redefinitions of larger and more important goals that everyone can pull toward together.”

[Fixes that Fail Systems Archetype](#) as explained on www.systemswiki.org

The Tragedy of the Commons

Definition (Meadows): “When there is a commonly shared resource, every user benefits directly from its use, but shares the costs of its abuse with everyone else. Therefore, there is very weak feedback from the condition of the resource to the decisions of the resource users. The consequence is overuse of the resource, eroding it until it becomes unavailable to anyone.”

The Way Out (Meadows): “Educate and exhort the users, so they understand the consequences of abusing the resource. And also restore or strengthen the missing feedback link, either by privatizing the resource so each user feels the direct consequences of its abuse or (since many resources cannot be privatized) by regulating the access of all users to the resource.”

[Tragedy of the Commons Systems Archetype](#) as explained on www.systemswiki.org

Drift to Low Performance

Definition (Meadows): “Allowing performance standards to be influenced by past performance, especially if there is a negative bias in perceiving past performance, sets up a reinforcing feedback loop of eroding goals that sets a system drifting toward low performance.”

The Way Out (Meadows): “Keep performance standards absolute. Even better, let standards be enhanced by the best actual performances instead of being discouraged by the worst. Use the same structure to set up a drift toward high performance!”

[Drifting Goals Systems Archetype](#) as explained on www.systemswiki.org

Escalation

Definition (Meadows): When the state of one stock is determined by trying to surpass the state of another stock -and vice versa- then there is a reinforcing feedback loop carrying the system into an arms race, a wealth race, a smear campaign, escalating loudness, escalating violence. The escalation is exponential and can lead to extremes surprisingly quickly. If nothing is done, the spiral will be stopped by someone's collapse - because exponential growth cannot go on forever.

The Way Out (Meadows): The best way out of this trap is to avoid getting in it. If caught in an escalating system, one can refuse to compete (unilaterally disarm), thereby interrupting the reinforcing loop. Or one can negotiate a new system with balancing loops to control the escalation.

[Escalation Systems Archetype](#) as explained on www.systemswiki.org

Success to the Successful

Definition (Meadows): If the winners of a competition are systematically rewarded with the means to win again, a reinforcing feedback loop is created by which, if it is allowed to proceed uninhibited, the winners eventually take all, while the losers are eliminated.

The Way Out (Meadows): Diversification, which allows those who are losing the competition to get out of that game and start another one; strict limitation on the fraction of the pie any one winner may win (antitrust laws); policies that level the playing field, removing some of the advantage of the strongest players or increasing the advantage of the weakest; policies that devise rewards for success that do not bias the next round of competition.

[Success to the Successful Systems Archetype](#) as explained on www.systemswiki.org

Shifting the Burden to the Intervener

Definition (Meadows): Shifting the burden, dependence, and addiction arise when a solution to a systemic problem reduces (or disguises) the symptoms, but does nothing to solve the underlying problem. Whether it is a substance that dulls one's perception or a policy that hides the underlying trouble, the drug of choice interferes with the actions that could solve the real problem.

If the intervention designed to correct the problem causes the self-maintaining capacity of the original system to atrophy or erode, then a destructive reinforcing feedback loop is set in motion. The system deteriorates; more and more of the solution is then required. The system will become more and more dependent on the intervention and less and less able to maintain its own desired state.

The Way Out (Meadows): Again, the best way out of this trap is to avoid getting in. Beware of symptom-relieving or signal-denying policies or practices that don't really address the problem. Take the focus off short-term relief and put it on long-term restructuring.

[Shifting the Burden Systems Archetype](#) as explained on www.systemswiki.org

[Addiction Systems Archetype](#) as explained on www.systemswiki.org

Rule Beating

Definition (Meadows): Rules to govern a system can lead to rule beating - perverse behaviour that gives the appearance of obeying the rules or achieving the goals, but that actually distorts the system.

The Way Out (Meadows): Design, or redesign, rules to release creativity not in the direction of beating the rules, but in the direction of achieving the purpose of the rules.

Seeking the Wrong Goal

Definition (Meadows): System behaviour is particularly sensitive to the goals of feedback loops. If the goals - the indicators of satisfaction of the rules - are defined inaccurately or incompletely, the system may obediently work to produce a result that is not really intended or wanted.

The Way Out (Meadows): Specify indicators and goals that reflect the real welfare of the system. Be especially careful not to confuse effort with result or you will end up with a system that is producing effort, not result.

References:

1) Meadows, Donella H., Thinking in Systems, Chelsea Green Publishing, 2008.

2) www.systemswiki.org

About Alwyn Smit

Alwyn has more than twenty years experience in the defence industry in the development of custom built system solutions for SANDF clients. He acted in both project management and system engineering roles on a number of major projects. Alwyn is a founding member of the South African Chapter of the International Council on Systems Engineering. He was the 2007 INCOSE SA Chapter President and is currently an INCOSE ambassador. He has developed a recent but very keen interest in the application of systems thinking to real world problems.

Systems Engineering News

INCOSE IS2010 – A Milestone Event

By A Smit

Despite a previous conviction that I simply cannot sleep upright like a chicken in a coop, I have done it again - I tackled the long trip from Cape Town to Chicago for the INCOSE International Symposium 2010 from 12 to 15 July, which also happened to be the 20th birthday anniversary of INCOSE.

Arriving on the Saturday and not having to attend one of the many business meetings scheduled over the weekend, I used the rest of the day to recover from flight-induced sleep deprivation. On Sunday I attended an IEEE paper track of 9 papers provided by the IEEE Aerospace and Electronic Systems Society, one of the IEEE Systems Council's members. The papers focused on the systems engineering of complex systems for space, air, ocean or ground environments. This is certainly a useful first time addition to the symposium that should really be repeated in future.

On Monday the symposium was in full swing. The day started with an opening plenary featuring a keynote speech on The Status and Nature of K-12 Engineering Education in the United States. To me this was an indication of the importance with which the youth outreach is viewed by INCOSE. The day continued with the usual 5 tracks of papers and panels which made you feel like a chameleon in a box of [Nestlé Smarties](#). Each track was divided into three sessions separated by coffee breaks and lunch, with each session having a specific theme. Themes included "SE Competence", "Enterprise Applications", "Energy Applications", "MBSE Applications", "SE Education", "Large Scale Architecture", "SE Applications in Transportation", "Resilient Systems", "Security Applications", and "Architecture of Complex Systems".

The two best paper awards for the day were "Design Principles for Ultra-Large-Scale (ULS) Systems" and "An Enterprise Systems Engineering Framework".

Panel discussions were also held on: "Is MBSE a Tectonic Shift in the Way We Perform Systems Engineering?", "Systems Engineering the Supply Chain: Multiple Perspectives from Transportation", "Biomedical SE: Modeling & Patient Safety from Pharma to Devices" and "ISO/IEC 156288 and 12207 Modeling to Assess Harmonization".

My personal interest was in SE Competency and SE Education, with highlights being the papers on "Systems Engineering Competency - The Missing Element in Engineering Education" by Charles Wasson, and "Graduate Program in Multi-Disciplinary System Design and Management" by a number of authors from Keio University. What is clear to me is that more and more people realize the need for not only teaching the "What" of Systems Engineering, but also the "How" and the "Why".

Tuesday again started with a keynote speech on "Perspectives on the Critical Role of Systems Engineering". The paper sessions saw a similar mix of session themes with most continued from Monday and with the addition of "SE Applications in

Defence”, “Commercial SE Applications”, “SE Principles”, “SE Knowledge Management” and “Systematic Strategy”. These sessions included a best paper award on “Simulation and Verification of (Dys)functional Behaviour Models: Model Checking for SE”.

The paper sessions were complemented by panel discussions/round tables on “Motor Sports Accelerates SySTEM Learning”, “Transportation Industry Roundtable: Assessing State of the Practice”, “The Future of Knowledge Management in INCOSE” and the all important Academic Forum addressing “Youth Engineering Education Outreach” and “The Graduate Reference Curriculum on Systems Engineering (GRCSE)”. This last session of the Academic Forum certainly created a stir with a presentation by Joe Kasser questioning the value of the [BKCASE](#) project consisting of the Body of Knowledge and the GRCSE. Personally I think he had a good point and when the first draft of GRCSE is released, I will be taking a critical look of my own at the real value added. Till then I will keep an open mind.

The keynote speech on Wednesday was on “Systems Engineering and Patient Safety” – everybody certainly sat up and took notice of the issues around patient safety and equipment interoperability. Session themes for Wednesday included “Decision Making”, “Complex Systems”, “Ontology”, “Requirements”, “SE Applications in Biomedical” and “Modular & Agile Architecture” with a Workshop on “Youth Engineering Education Outreach”, panels on “Lean SE: Who can Afford to Ignore it?” and “Self Organising vs Standards-Based System-Security Strategy - Conflict or Synergy”, roundtable on “Critical Unmet Biomedical System Needs” and the continuation of the Academic Forum with “Leveraging Motor Sports to Accelerate SySTEM Learning” and “System Engineering Research: Content and Future Trends”. The last paper session on “Requirements” included an award winning paper on “RELAAY - A Tool to Guide HSI Requirements”. This was indeed an impressive paper with a lot of research behind it to look at incident data, filter out the Human Systems Integration related causes and feed it back to the designers of new systems - all automated in a set of spreadsheets. A valuable tool if you really want to learn from the lessons learnt.

Wednesday also saw the usual Symposium Banquet and was held at the Navy Pier. The food and entertainment were great as we have become accustomed to, but the highlight was an absolutely awesome fireworks display. What a superb way to celebrate the 20th anniversary of INCOSE!



Trying to capture this in a photo is simply not possible, but my good colleague René Oosthuizen certainly tried.

Thursday is thankfully always a shorter day with only two instead of three paper sessions in four tracks. The session themes included “Models for Risk Management”, “Space Systems Applications”, “Architecture of Complex Systems”, “Agile Systems”, “Early R&D Applications”, “Systems Management”, “ROI & Lean SE” as well as a panel discussion on “Architecting the Enterprise: Is INCOSE up to the Challenge?”. The day included two best paper awards for “Classification of Systems from Component Characteristics” and “Piloting Model Based Engineering Techniques for Spacecraft Concepts in Early Formulation”. Personally I have found the paper presented by Eric Honour on “Systems Engineering Return on Investment” really enlightening. Besides basically confirming the amount of SE done by successful projects to be around 15 %, the research showed that projects doing the proper amount of SE do not necessarily deliver better systems. This was indeed surprising – it basically means that even if you do not do SE formally, you will eventually be able to deliver a good system, be it at huge overspending and late delivery. With some more research to be done, I will definitely want to see the final outcome of this project! The day and the conference were concluded with a closing plenary feature a keynote speech on “Systems Engineering in a European Space Company”.

What more can be said besides that this conference has really overturned my previous conviction that long distance flights to attend these symposia are not worth the pain and discomfort.

Upcoming Submission Deadlines and Themes for INSIGHT

INSIGHT is the newsletter of International Council on Systems Engineering. It is published four times per year (January, April, July, October). INSIGHT features status and information about INCOSE's technical work, local chapters, and committees and boards. Additionally, related events, editorials, book reviews, trends, and how-to-do articles that are pertinent to the many aspects of a systems engineer's job are also included, as space permits.

Upcoming submission deadlines and themes for INSIGHT

Issue	Submission Date for General Articles	Theme	Theme Editor	Deadline for Theme Article Proposal*
3rd Qtr 2010	8 Aug 2010**	2010 International Symposium Coverage: Chicago, Illinois, USA	Jack Stein	11 Nov 2009
4th Qtr 2010	15 Oct 2010	Systems Development from Deep Sea to Deep Space: Lessons from the Johns Hopkins Applied Physics Lab	Mike O'Driscoll and Sam Seymour	
1st Qtr 2011	15 Feb 2011	Knowledge Management for Systems Engineering	Regina Griego	21 May 2010
2nd Qtr 2011	15 May 2011	Systems of Systems and Self-Organizing Security**	Rick Dove, Ken Kepchar, Jennifer Bayuk	

*Submission deadline moves according to International Symposium date

** Please contact the theme editor by 18 August 2010 to propose a theme article.

[More information](#)

INCOSE INSIGHT - July 2010, Vol 13 - Issue 2

The July 2010 INSIGHT is ready to view or download on [INCOSE Connect](#).

Special Feature:

The Best of Loughborough: Highlights from the Conference on Systems Engineering Research

Systems Engineering - Volume13, Issue3, 2010.

[Early View](#) (Articles Available Online in Advance of Print)

Call for Nominations: Peter P. Chen Award 2010

Initiated by Elsevier in 2008 to celebrate the 25th anniversary of the journal Data and Knowledge Engineering, the Peter P. Chen award honors one person each year for his or her outstanding contributions to the field of conceptual modeling. One person will be selected each year to receive a plaque and check for \$1000 (US\$). The award is announced and presented each year at the ER Series conference.

[More information](#)

Featured Societies

International Test and Evaluation Association (ITEA)

The International Test and Evaluation Association (ITEA) is a not-for-profit educational organization founded in 1980 to further

the exchange of technical information in the field of test and evaluation. Its members include professionals from industry, government, and academia, who are involved in the development and application of policy and techniques used to assess the effectiveness, reliability, and safety of new and existing systems and products.

The vision of ITEA is to be recognized as the premier professional association for the international Test and Evaluation community. The mission of ITEA is to advance the field of Test and Evaluation worldwide in government, industry and academia. ITEA is open to both individual and corporate members.

ITEA is governed by a Board of Directors, supported by Regional Vice-Presidents. National Committees conduct the work of the association, supported by paid staff based at ITEA's Fairfax, VA, U.S.A. Central office. ITEA has chapters throughout the United States, plus a chapter based in each of Israel, Australia and Europe.

ITEA conducts an annual symposium, the next being at Glendale, AZ, U.S.A. The theme for this symposium is "The Future of T&E: Evaluating Operational Effectiveness in a Joint Mission Environment".

ITEA is well connected to the broader systems engineering community. For example, a recent edition of the The ITEA Journal of Test and Evaluation contains an article "The Role of Test and Evaluation in Systems Engineering and Management" by Andrew P. Sage, Ph.D. The Systems Engineering Society of Australia (SESA) runs its annual conference jointly with ITEA.

More information: www.itea.org

INCOSE Technical Operations

Systems Security Engineering Working Group

<http://www.incose.org/practice/techactivities/wg/securitywg/>

Charter

Current system security strategies are failing and cannot be fixed by security engineers alone. The reason for failure is evident: attack communities operates as intelligent, multi-agent, self organizing, system-of-systems – with swarm intelligence, tight learning loops, fast evolution, and dedicated intent. With few exceptions, the systems being targeted are alone, senseless and defenseless – relying on outside benevolence for protection, whether this be separate security systems, laws and penalties, or perceived probabilities of being an overlooked target.

This working group believes that system engineering cannot succeed without accepting core responsibility for enabling and facilitation effective system security – partly in system requirements, partly in system trade space recognition, but mainly in system thinking applied to concepts of operations and systems architecture. Sustaining system functionality in the face of intelligent determined attack requires self preservation capabilities that adapt and evolve with equal intelligence, determination, and strength of community. This requires full system awareness and adaptability, and system-of-system relationships. Security engineering alone cannot accomplish this.

It is fitting for INCOSE to tackle Next Generation Security, as the issues are leading edge systems engineering issues: architecture, systems of systems, self organizing systems, security tradeoffs with human factors, systems thinking – things that are typically high level integrated-system SE issues.

Participants in this working group's projects are developing vanguard critical understandings.

Leadership

Chair: Rick Dove, Stevens Institute of Technology

Co-Chair: TBD

Contact [Systems Security Engineering WG](#) for membership and access to the [member activity site](#).

Accomplishments and Products

- A declaration of responsibility, outlining the nature of and reasons for integrating security enabling capabilities as core system engineering concerns, published in April 2008 INSIGHT issue.
- Twelve essays addressing The Interplay of Architecture, Security, and Systems Engineering, published as the theme for

the July 2009 INSIGHT issue. Current Projects

- Discovering and illuminating path-finder system-security patterns, characterized by self organization, adaptable tactics, reactive resilience, evolving strategy, proactive innovation, and harmonious presence.
- Planning for paper-session at IS11
- Planning for catalytic event of shared vision between SysE and SecE communities.
- Becoming involved with the role of standards in effective system security.

Joint Activities and Products

Architecture Working Group –collaborated on the 12 essays of The Interplay of Architecture, Security, and Systems Engineering. published in the July 2009 INSIGHT.

Systems Engineering Software Tools News

Rommana 10.2 is Now Available to Download for Free

Rommana 10.2 brings over 45 new features in different Rommana Components. To see a partial list of these features, visit:

<http://www.rommanasoftware.com/rommana102release.php>

No Magic Announces Online SysML Training

No Magic, Inc., claiming to be the leading global provider of integrated modeling software and services, announced a new SysML™ online training course designed to teach system engineers and analysts, test engineers or anyone interested in Systems Engineering everything they need to know about SysML and its use within MagicDraw.

[More information](#)

The OMG SysML V. 1.2 Minor Revision, Is Now Available

You can download the revision from the [SysML.org Specifications page](#) or the [OMG web](#)

Atego launches Atego Process Director

Atego, claiming to be the leading independent supplier of industrial-grade, collaborative development tools for engineering complex, mission- and safety-critical architectures, systems, software and hardware, has launched Atego Process Director, a ground-breaking, new web-based environment for process definition, management and deployment.

[More information](#)

Systems Engineering Books, Reports, Articles and Papers

Systems Thinking for Curious Managers: With 40 New Management F-Laws



by [Jamshid Gharajedaghi](#) (Foreword), [Russell L. Ackoff](#) (Author), [Herbert Addison](#) (Contributor), [Andrew Carey](#) (Contributor)
Publisher: Triarchy Press (18 Mar 2010)

ISBN-10: 0956263151
ISBN-13: 978-0956263155

Product Description

This gem of a book introduces the extraordinary world of Systems Thinking and its 'Dean', Russell Ackoff, to curious and enquiring managers, teachers, business people - anyone, anywhere who works in an organisation. Finished just before Professor Ackoff's death late in 2009, "Systems Thinking for Curious Managers" opens the door to a joined up way of thinking about things that has profoundly influenced thinkers and doers in the fields of business, politics, economics, biology, psychology. Although Systems Thinking was 'invented' early in the 20th century, even Peter Senge's best-selling "The Fifth Discipline" (Systems Thinking is the fifth discipline) failed to popularise the term. But now, in business and academia, in the public sector and in the search for solutions to the environmental problems we face, Systems Thinking is being talked about everywhere. In the same way, it's only since his death in 2009 that management thinker, writer and guru Russell Ackoff has achieved the reputation he deserves. This timely book presents 40 more of Russ Ackoff's famously witty and incisive f-Laws (or flaws) of business - following on from his 2007 collection "Management f-Laws". All those in this collection are new and previously unpublished. Andrew Carey's extended introduction ties these f-Laws into the rest of Ackoff's work and gives the reader new to Systems Thinking a practical guide to the implications of Systems Thinking for organisations and managers. The Foreword by Jamshid Gharajedaghi is a moving tribute from Ackoff's friend and business partner of many years.TBD

[More Information](#)

Supply Chain Engineering: Useful Methods and Techniques



Alexandre Dolgui (Author), Jean-Marie Proth (Author)
Publisher: Springer; 1st Edition. edition (August 14, 2010)
ISBN-10: 184996016X
ISBN-13: 978-1849960168

Product Description

Supply Chain Engineering considers how modern production and operations management (POM) techniques can respond to the pressures of the competitive global marketplace by integrating all activities in the supply chain, adding flexibility to the system, and drastically reducing production cost.

Several POM challenges are answered through a comprehensive analysis of concepts and models that assist the selection of outsourcing strategies and dynamic pricing policies. Supply Chain Engineering presents inventory management techniques in supply chains, radio frequency identification (RFID) technologies, and methods for the design of flexible and re-configurable manufacturing systems, as well as real-time assignment and scheduling methods. A significant part of the book is also devoted to:

- lean manufacturing,
- line balancing (assembly lines, U-lines, and bucket brigades),
- dynamic facilities layout approaches, and
- new warehousing techniques.

Explanations are given using basic examples and detailed algorithms, while discarding complex and unnecessary theoretical minutiae. In addition, all the examples have been carefully selected with a view to eventual industrial application.

Supply Chain Engineering is written for students and professors in industrial and systems engineering, management science, operations management, and business. It is also an informative reference for industrial managers looking to improve the efficiency and effectiveness of their production systems.

[More information](#)

NASA Announces Systems Engineering Competition Winners

Students from the Massachusetts Institute of Technology, Cambridge, Mass., are the 1st place winners of NASA's systems engineering paper competition. The winning paper, "Cathode/Anode Satellite Thruster for Orbital Repositioning" earned the team a \$3,500 scholarship and an invitation to view a future launch at NASA's Kennedy Space Center, Fla.

[More information](#)

Engineering and Scientific Presentations

Gavan Lintern

.....A scientific or engineering presentation is a performance. When you present, are you satisfied merely by getting through this performance or do you want it to be as good as you can make it? For many of us in scientific and engineering professions, presentation at a conference is generally a choice; it is rarely a required duty of our employment. Why do we volunteer for that? For some, it comes down to an expenses paid visit to another city, possibly even another country. However, for others, it is a matter of professional pride. We think the work we are doing is significant and we imagine others will benefit from knowing about it. If you fall into that group for whom this is a matter of professional pride, read on.....

[More information](#)

Systems Thinking and Education for Sustainability: Educating Systems Citizens for the World We Are Living Into

A conversation with Peter Senge

This interview with Peter Senge (PS) of SoL (the Society for Organizational Learning) and Massachusetts Institute of Technology was conducted by telephone on April 22, 2010. The interviewer was Faye Benedict (FB) of the Norwegian University of Life Sciences and the EU Comenius Lifelong Learning project "SUPPORT: Partnership and Participation for a Sustainable Tomorrow."

[More information](#)

Conferences and Meetings

IIBA® Webinar Series NEW

You are invited to the next presentations in the IIBA Webinar Series:

Introduction to the Certification of Competency in Business Analysis™(CCBA™)

Monday, July 26, 2010 at 12 p.m. to 1 p.m. EDT (UTC/GMT -4 hours)

Presented by Paula Maychruk, VP Certification and Suzanne Bertschi, Certification Product Manager

International Institute of Business Analysis (IIBA) is pleased to announce a new business analysis certification. The Certification of Competency in Business Analysis™(CCBA™) is an intermediate level designation that will launch by the end of 2010. The CCBA™ designation is a stepping stone to obtaining the Certified Business Analysis Professional™(CBAP®) designation and provides recognition for individuals who have business analysis experience but don't yet meet the requirements for the CBAP® designation.

Key learning points include:

- IIBA® vision for the CCBA™ designation
- Target audience
- Application requirements
- Launch dates

- Differentiating the CBAP® / CCBA™ designations

This webinar is open to members and non members. [Register](#) now.

Being a BA - Technical Excellence with Tom Karasmanis

Tuesday, July 27, 2010 at 12 p.m. to 1 p.m. EDT (UTC/GMT -4 hours)

Tom is the Chief Architect of IIBA, and a very experienced BA. Over the last 25 years he has worked at all organizational levels and in various roles including project business analysis, strategic work, managing teams of BAs and more.

This webinar is open to members only. [Register](#) now.

Please note: The webinars are limited to 1000 participants, and only the first 1000 people who have logged in at the time the presentation begins will have access to the live webinar. If you receive an error message when you log in, that means 1000 people have already logged in and the session is full. If you cannot access the webinar and you are an IIBA member, you can listen to the archived event which will be available on the IIBA website.

These and all previous presentations will be archived on our website after the live viewing date. They will also include audio, plus an email address to direct questions to. Please [visit](#) the Public or Members-only Archived Webinars pages.

For more information on our Webinar Series including a list of upcoming topics, please visit the IIBA [website](#).

Questions? Please contact Tracy Cook at webinar@theiiba.org

[More information](#)

System Dynamics Society 2010 Conference

July 25 – 29, 2010, Seoul, Korea

[More information](#)

2010 International Conference of Organizational Innovation (2010 ICOI)

August 4 - 6, 2010, Siam University, Bangkok, Thailand

[More information](#)

ECAI 2010 Workshop on Intelligent Engineering Techniques for Knowledge Bases

August 16, 2010, Lisbon, Portugal

[More information](#)

2nd International Workshop on Open Design Spaces (ODS 2010) - Socially Crafting Interactive Experiences

in conjunction with DIS 2010

August 17 2010, Aarhus, Denmark

[More information](#)

The 7th Annual INCOSE SA Conference

August 17 - 19, 2010, CSIR International Convention Centre, Pretoria, South Africa

[More Information](#)

The 2nd International Workshop on Enterprise Architecture Challenges and Responses

To be held in conjunction with ICIS 2010
August 18 – 20, 2010, Yamagata University, Yonezawa, Japan
[More information](#)

The Second International Conference on Advances in System Testing and Validation Lifecycle (VALID 2010)

August 22-27, 2010 - Nice, France
[More information](#)

Improving Systems and Software Engineering Conference (ISSEC 2010)

23 - 26 August 2010
Brisbane Convention & Exhibition Centre, Brisbane, Australia
[More information](#)

INCOSE San Francisco Bay Area Chapter Systems Engineering Certification Class

August 28-29, 2010, Santa Clara, CA, USA
[More information](#)

Workshop on Multi-Agent Systems and Simulation (MAS&S)

August 30 – Sep 3, 2010, Lyon (France)
[More information](#)

2nd International Workshop on Model-Driven User-Centric Design & Engineering (MDUCDE'10)

September 1st & 2nd, 2010, Valenciennes/France
[More information](#)

European Systems & Software Process Improvement and Innovation

1-3 September 2010, Grenoble Institute of Technology, France
[More information](#)

INTERACT 2011 - 13th IFIP TC13 Conference on Human-Computer Interaction

September 05-09, 2011, Lisbon, Portugal.
[More information](#)

Summer School 2010: Verification Technology, Systems & Applications

September, 06th-10th, 2010, University of Luxembourg, Luxembourg
[More information](#)

3rd Workshop on Autonomic and SELF-adaptive Systems

September 8, 2010, Valencia, Spain
[More information](#)

1st International Workshop on Reuse in Business Process Management (rBPM 2010)

September 13, 2010, Hoboken, New Jersey – USA

[More information](#)

2010 Annual ITEA Symposium NEW

September 13 - 16, 2010, Renaissance Glendale Hotel & Spa, Glendale, AZ, USA

[More information](#)

Modeling Business Information Systems (MoBIS 2010)

September 15-17, 2010, Dresden, Germany

[More information](#)

7th International Conference on Quantitative Evaluation of SysTems (QEST) 2010

September 15 - 18, 2010, Williamsburg, Virginia, USA at the College of William & Mary, Computer Science Department,

[More information](#)

First International Workshop on Evolution Support for Model-Based Development and Testing (EMDT2010)

Co-located with the International Scientific Colloquium (IWK2010)

September 16, 2010, Ilmenau, Germany

[More information](#)

15th International Workshop on Formal Methods for Industrial Critical Systems (FMICS 2010)

September 20-21, 2010, Antwerp, Belgium

[More information](#)

3rd International PERADA-ASSYST Summer School on Adaptive Socio-Technical Pervasive Systems NEW

Sept. 20-27 2010, Europa Conference Center, Budapest, Hungary

[More information](#)

12th International Workshop on Verification of Infinite-State Systems (INFINITY 2010)

September 21, 2010, Singapore

[More information](#)

8th International Symposium on Automated Technology for Verification and Analysis (ATVA 2010)

21-24 September 2010, Singapore

[More information](#)

EPEW 2010: 7th European Performance Engineering Workshop

University Residential Center of Bertinoro, Italy

23-24 September 2010

[More information](#)

Challenges of Systems Engineering - International Workshop (RuSEC2010)

September 23-24, 2010, Moscow, Russia

[More information](#)

ACM International Conference on Design of Communication (SIGDOC'10)

September 26-29, 2010, São Carlos - São Paulo - Brazil

[More information](#)

1st Brazilian Workshop on Model-Driven Development

September 27, 2010, Salvador, Bahia, Brazil

[More information](#)

Fourth IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO 2010)

September 27-October 1, 2010, Budapest, Hungary

[More information](#)

Workshop on Socio-Economics Inspiring Self-Managed Systems and Concepts (SEISMYC 2010)

Located at SASO 2010

September 27th, 2010, Budapest, Hungary

[More information](#)

Doctoral Symposium @ RE2010

September 27, 2010, Sydney, Australia

[More information](#)

Third International Workshop on Managing Requirements Knowledge (MaRK'10)

September 27, 2010, Sydney, Australia

[More information](#)

54th Annual Meeting of the Human Factors and Ergonomics Society

September 27-October 1, 2010, San Francisco

[More information](#)

The 18th International Requirements Engineering Conference (RE 2010)

Sep 27, 2010 - Oct 1, 2010, Sydney, Australia

[More information](#)

Fourth IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO 2010)

September 27-October 1, 2010, Budapest, Hungary

[More information](#)

Model-based Testing and Test Automation - From Research into Practice (MoTes2010)

September 27 – October 2, Leipzig, Germany

[More information](#)

Fifth International Conference on Graph Transformation

27 September - 2 October, 2010. University Of Twente, Enschede, The Netherlands

[More information](#)

REET'10 Fifth International Workshop on Requirements Engineering Education and Training

In conjunction with the 18th IEEE International Requirements Engineering Conference

September 28, 2010, Sydney, Australia

[More information](#)

RELAW'10 Third International Workshop on Requirements Engineering and Law

In conjunction with the 18th IEEE International Requirements Engineering Conference

September 28, 2010, Sydney, Australia

[More information](#)

REV'10 Fifth International Workshop on Requirements Engineering Visualization

In conjunction with the 18th IEEE International Requirements Engineering Conference

September 28, 2010 - Sydney, Australia

[More information](#)

1st Workshop on The Web and Requirements Engineering (WeRE'10)

To be held in conjunction with the RE 2010 Joint Conference

September 28, 2010, Sydney, Australia

[More information](#)

4th International Workshop on Graph Based Tools

A satellite event of ICGT'10

September 28th 2010, University of Twente, Enschede, The Netherlands

[More information](#)

PDMC 2010

9th International Workshop on Parallel and Distributed Methods in verifiCation

Joint with 2nd International Workshop on High Performance Computational Systems Biology (HiBi 2010)

September 30 - October 1, 2010, Twente, The Netherlands

Co-locating with

5th International Conference on Graph Transformation (ICGT 2010) , 29 September - 1 October, 2010

17th Annual workshop on Software Model Checking (SPIN 2010), 27 September - 29 September, 2010

[More information](#)

First Workshop on Model Driven Interoperability (MDI'2010)

In Conjunction with Models 2010

October 3-5, 2010, Oslo, Norway

[More information](#)

3rd International Workshop on Model Based Architecting and Construction of Embedded Systems

In Conjunction with Models 2010
October 3-5, 2010, Oslo, Norway

[More information](#)

5th International Workshop models@run.time

In Conjunction with Models 2010
October 3-8, 2010, Oslo, Norway

[More information](#)

Workshop on OCL and Textual Modelling

In Conjunction with Models 2010
October 3-8, 2010, Oslo, Norway

[More information](#)

4th International Workshop on Multi-Paradigm Modeling - MPM'10

In Conjunction with Models 2010
October 3-8, 2010, Oslo, Norway

[More information](#)

ACM/IEEE 13th International Conference on Model Driven Engineering Languages and Systems

October 3-8, 2010, Oslo, Norway

[More information](#)

Fourth Asia-Pacific Conference on Systems Engineering (APCOSE 2010)

4 - 6 October, 2010. Keelung, Taiwan.

[More information](#) | [Brochure](#)

2010 iese User Conference

October 4-6, 2010, The Westin Providence, Providence, Rhode Island, USA

[More information](#)

IFM 2010: Integrated Formal Methods 8th International Conference

October 11 – 14, 2010, Nancy, France

[More information](#)

INCOSE LA Mini-Conference 2010

October 16, 2010, Loyola Marymount University, Los Angeles, USA

[More information](#)

Sixth Nordic Conference on Human-Computer Interaction (NordiCHI 2010)

October 16 – 20, Reykjavik Iceland

[More information](#)

World Engineering Congress and Exhibition: ENGINEERING 2010 – ARGENTINA: “Technology, Innovation and Production for Sustainable Development”

October 17 - 20 2010, Buenos Aires, Argentina

[More information](#)

International Institute of Business Analysis (IIBA) Conference

October 17-21, 2010, Alexandria, VA, USA

[More information](#)

Dynamic Languages Symposium 2010

Co-located with SPLASH 2010

In cooperation with ACM SIGPLAN (PENDING)

October 18, 2010, Reno, Nevada, USA

[More information](#)

SEArI Research Summit 2010 **NEW**

October 19, 2010, MIT Media Lab, Cambridge, MA, United States of America

[More information](#)

FMCAD 2010 - Formal Methods in Computer Aided Design

October 20 – 23, 2010, Lugano, Switzerland

[More information](#)

MIT Systems Thinking Conference

October 21-22, 2010, Broad Auditorium, 7 Cambridge Center, Cambridge, Massachusetts, USA

[More information](#)

NDIA 13th Annual Systems Engineering Conference

October 25-28, 2010, Hyatt Regency Mission Bay, San Diego, CA, USA

[More information](#)

Requirements Days 2010

October 26 – 28, 2010, München, Germany

[More information](#)

5th International Workshop on Enterprise Integration, Interoperability and Networking (EI2N'2010)

October 27-28, 2010, Hersonissou, Crete, Greece

[More information](#)

Complex Systems Design & Management 2010

October 27-29, 2010, Paris, France

[More Information](#)

12th IEEE International High Assurance Systems Engineering Symposium (HASE 2010)

Co-Located with the 21st IEEE International Symposium on Software Reliability Engineering (ISSRE)

November 1-4, 2010, San Jose, CA, USA

[More information](#)

29th International Conference on Conceptual Modeling

1-4 November 2010, Vancouver, BC, Canada

[More information](#)

Seventh International Workshop on Web Information Systems Modeling (WISM 2010)

(Held in conjunction with ER 2010)

November 1-4, 2010, Vancouver, BC, Canada

[More information](#)

2010 IITA International Conference on Control, Automation and Systems Engineering (CASE 2010)

Nov 7, 2010 - Nov 8, 2010. Taipei, Taiwan

[More information](#)

No Magic World Conference

November 7-10th, 2010, American Airlines Conference Center, Fort Worth, TX

[More information](#)

Annual Systems Engineering Conference 2010 (ASEC10)

November 8-10, 2010, Heythrop Park Hotel, Chipping Norton, Oxfordshire, UK

[More information](#)

SEPG Latin America 2010

November 10-12, 2010, Medellín, Colombia

[More information](#)

Association for the Advancement of Artificial Intelligence (AAAI) Fall Symposium: Complex Adaptive Systems: Resilience, Robustness, and Evolvability

November 11 - 13, 2010, Arlington, VA

[More information](#)

5th Trends in Enterprise Architecture Research (TEAR2010) workshop

November 12, 2010 as part of the Enterprise Engineering Week at the Delft University of Technology, Delft, The Netherlands from the 9th of November to the 12th of November

[More information](#)

CMMI 10th Annual Technology Conference and User Group

November 15-18, 2010
Hyatt Regency Tech Center – Denver, Colorado, USA

[More information](#)

Third IEEE International workshop UML and Formal Methods

Held in conjunction with the 12th International Conference on Formal Engineering Methods, ICFEM 2010
November 16th, 2010, Shanghai, China

[More information](#)

5th International Forum on Engineering Education (IFEE2010) & European SDPROMO II Conference

November 23 - 25, 2010, Sharjah-Dubai, UAE, United Arab Emirates

[More information](#)

1st International Chemical and Environmental Engineering Conference 2010

November 26 - 28, 2010, Kuala Lumpur, Malaysia

[More information](#)

22nd International Conference Software & Systems Engineering and their Applications (ICSSEA 2010)

December 7-9, 2010, Paris, France

[More information](#)

National Institute of Technology – National Systems Conference 2010

December 10-12, 2010, National Institute Technology Karnataka, Surathkal, India

[More information](#)

ICISE 2010: International Conference on Intelligent Systems Engineering

December 18, 2010, Bangkok, Thailand

[More information](#)

ICECSE 2011 "International Conference on Electrical, Computer and Systems Engineering"

January 25-27, 2011, Dubai, United Arab Emirates

[More information](#)

Second ACM/SPEC International Conference on Performance Engineering (ICPE 2011)

March 14-16, 2011 Karlsruhe, Germany

[More information](#)

Design, Automation & Test in Europe

March 14-18, 2011, Grenoble, France

[More information](#)

26th Symposium On Applied Computing

March 21 - 25, 2011, Tunghai University, TaiChung, Taiwan

[More information](#)

IWEI 2011 - The International Working Conference on Enterprise Interoperability

March 22-24, 2011, Stockholm, Sweden

[More information](#)

Risk-Based Approaches to Major Decisions (Risk '11)

May 13 - 14, 2011, Falmouth, Cornwall, United Kingdom

[More information](#)

Education & Academia

University of Loughborough - Engineering Systems of Systems

The Engineering System of Systems (ESoS) group researches the:		Complex Socio-technical Systems
	<ul style="list-style-type: none"> ▪ Interoperability of ... ▪ Sustainability of ... ▪ Reconfigurability of ... 	
	To improve the predictability of ...	
	To enable the creation of usable ...	

[More information](#)

Federal University of Minas Gerais in Belo Horizonte (Brazil) Introduces Systems Engineering Course

The Federal University of Minas Gerais (University Federal de Minas Gerais) in Belo Horizonte, Brazil (UFMG) has introduced, commencing this year, a course in systems engineering (engenharia de sistemas) Brazil. The curriculum combines systems engineering principles with three core discipline areas:

- fundamentals of mathematics
- fundamentals of electrics and electronics
- fundamentals of humanities.

The concept of delivery is the simulation of a multi-disciplinary project.

More information: <http://sistemas.eng.ufmg.br/index.htm> (in Portuguese)

Some Systems Engineering-Relevant Websites

<http://support-edu.org/>

The goal of SUPPORT -Partnership and Participation for a Sustainable Tomorrow- is to promote and enhance the quality of education for sustainable development by linking schools, research institutions and communities in a web-based network.

Standards and Guides

Tutorial: Architectural Rendering with ISO/IEC 42010

At 4th European Conference on Software Architecture
August 23, 2010, IT University of Copenhagen, Denmark

IEEE Standard 1471, Recommended Practice for Architectural Description of Software-Intensive Systems, was published in 2000 as the first standard aimed at architecture description. In 2007, it was adopted by ISO and since then has been jointly updated by IEEE and ISO as ISO/IEC/IEEE 42010, Systems and software engineering — Architecture description.

This tutorial introduces the key concepts and mechanisms of the newly revised standard, in the context of practical approaches to architectural rendering of software-intensive systems.

[More information](#)

James Moore Receives Top Standards Award

James W. Moore, the IEEE Computer Society's Vice President of Professional Activities, has been named the recipient of the IEEE Charles Proteus Steinmetz Award.

The Steinmetz Award, established in 1979, is the IEEE's top standards honor. Consisting of a bronze medal, certificate, and honorarium, the award recognizes exceptional contributions to the development and/or advancement of standards in electrical and electronics engineering.

[More information](#)

Towards the Provision of Assistance for Very Small Entities in Deploying Software Lifecycle Standards

Rory V. O'Connor, Claude Y. Laporte

ABSTRACT

This paper outlines the recent development of a series of detailed guidelines known as "Deployment Packages" (DPs) for use with the emerging ISO/IEC 29110 software process lifecycle standard for Very Small Entities (VSEs). Such DPs are intended to provide detailed guidelines and explanation presenting in more detail the processes defined in the ISO/IEC 29110 profiles. This paper will also outline a pilot project initiative currently underway to evaluate these Deployment Packages and assist very small companies in understanding and exploring the potential usage of an international software process development standard.

[More information](#)

Some Definitions to Close On

Specification

Specification: A collection of requirements which, when taken together, constitute the criteria that define the functions and attributes of a system, or an item.

Source: *ARP4754 - Certification Considerations for Highly-integrated or Complex Aircraft Systems (1996)*

Specification: A document that clearly and accurately describes requirements and other characteristics for a product and the

procedures to be used to determine that the product satisfies these requirements. Two types of specifications are defined in this Standard: performance and detail. Three states of specifications are defined in this Standard: conceptual, initial, and definitized.

Source: *EIA/IS-731.1 - Systems Engineering Capability Model (1996)*

Specification: A document that fully describes a design element or its interfaces in terms of requirements (functional, performance, constraints, and design characteristics) and the qualification conditions and procedures for each requirement.

Source: *ISO/IEC 26702 (2005), IEEE Std 1220-2005*

Specification: A document used in development and procurement that describes the technical requirements for items, materials, and services including the procedures by which it will be determined that the requirements have been met. Specifications may be unique to a specific program (program-peculiar) or they may be common to several applications (general in nature).

Source: *Glossary: Defense Acquisition Acronyms and Terms (2009)*

Specification: Exact statement of the particular needs to be satisfied, or essential characteristics that a customer requires (in a good, material, method, process, service, system, or work) and which a vendor must deliver.

Source: www.businessdictionary.com (2010)

Specification: a detailed description of the parts of a whole

Source: www.yourdictionary.com (2010)

Specification: a statement or enumeration of particulars, as to actual or required size, quality, performance, terms, etc.: specifications for a new building.

Source: www.yourdictionary.com (2010)

Specification: A detailed, exact statement of particulars, especially a statement prescribing materials, dimensions, and quality of work for something to be built, installed, or manufactured.

Source: www.yourdictionary.com (2010)

Specification: A description of something that is sufficiently detailed to provide someone with all the information necessary to manufacture it.

Source: www.yourdictionary.com/computer/specification

Comments from Robert:

Two themes can be identified within the above definitions. The first is the specification of requirements. The second is the specification of design. That leads to the important distinction between "requirements specifications" and "design specifications", a distinction that an enterprise should make explicit if there is potential for confusion or misunderstanding.

Some of the definitions include the procedures to be used to determine that the product satisfies the requirements within the definition of a specification. **Is a requirements specification or a design specification not a specification if it doesn't include these procedures?** I think not. In fact, there is long established practice of separating:

- the requirements on an item (giving a XYZ requirements specification)
- the requirements on the qualities of evidence that each requirement has been met (giving a verification requirements specification)
- the procedures for providing the specified qualities of evidence (giving verification or test procedures)

One of the definitions includes "clearly and accurately" within the definition of "specification". If it is unclear and inaccurate, is it not a specification, or simply a poor specification. **The qualities of an item that make an item a "good" item should never be included in the definition of the item.**

Project Performance International News

PPI at INCOSE IS10

PPI was a Bronze Sponsor and Exhibitor at the 2010 INCOSE International Symposium in Chicago over 12 - 15 July, 2010.

Prize Draw Winner - Peter Sjöberg of Volvo Construction Equipment won our prize draw which included an Australian novelty hat, genuine boomerang and an inflatable "Skippy" kangaroo.

Matrix Game - PPI Prize Winner - Holly Kellogg of NAVAIR won a free attendance to PPI's Systems Engineering 5-Day course and workshop, valued over US\$2,800.

Welcome to iMobile Productivity – a New PPI Business Unit

PPI has, this month, formed a new consultancy business unit, iMobile Productivity, with a mission to improve enterprise productivity through the integration into business and project systems of mobile technology platforms. Devices such as iPad and iPhone with tactile surfaces and continuous internet connectivity at an individual level can increase productivity in many aspects. iMobile Productivity is operating only in Australia at this time. If you would like to discuss how continuous internet connectivity can improve, for example, design reviews, customer interaction in agile development, maintenance solutions, operation of Integrated Product Teams, training solutions, or other potential applications of interest, contact iMP Principal Consultant – IT Michael Fletcher in Australia 03 9876 7345.

Project Performance International Events

Systems Engineering 5-Day Courses

Upcoming locations include:

- Melbourne, Australia
- Las Vegas, USA
- São José dos Campos, Brazil
- Rio de Janeiro, Brazil
- Stellenbosch, South Africa
- London, UK

[View 2010/2011 Systems Engineering Course Schedule](#)

Requirements Analysis and Specification Writing 5-Day Courses

Upcoming locations include:

- Las Vegas, USA
- Amsterdam, The Netherlands
- Stellenbosch, South Africa
- Adelaide, Australia

[View 2010/2011 RA&SW Course Schedule](#)

OCD/CONOPS 5-Day Courses

Upcoming locations include:

- Adelaide, Australia
- Bristol, UK
- Las Vegas, USA
- Pretoria, South Africa

[View 2010/2011 OCD/CONOPS Course Schedule](#)

Software Engineering 5-Day Courses

Upcoming locations include:

- Pretoria, South Africa
- Las Vegas, USA

- Sydney, Australia

[View 2010/2011 Software Engineering Course Schedule](#)

Cognitive Systems Engineering 5-Day Courses

Upcoming locations include:

- Adelaide, Australia

[View 2010/2011 Cognitive Systems Engineering Course Schedule](#)

PPI Upcoming Participation in Professional Conferences

- August 12 - 13, 2010 - **SPOLM 2010** - Rio de Janeiro, Brazil (Exhibiting)
 - August 17-19, 2010 - **INCOSE SA Annual Conference 2010** - Pretoria, Gauteng, South Africa (Sponsor/Exhibiting)
 - September 23-24, 2010 - **RuSEC 2010** - Moscow, Russia (Exhibiting)
 - September 28 - October 1, 2010 - **XI SIGE** - São José dos Campos, Brazil (Sponsor/Exhibiting)
 - October 4 - 6, 2010 - **APCOSE 2010** - Keelung, Taiwan (Exhibiting)
 - October 25 - 28, 2010 - **NDIA SE Conference** - San Diego, CA, USA (Exhibiting)
-

Kind regards from the SyEN team:

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