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BOOK OF ABSTRACTS

This document contains all the abstracts received by the conference Program Committee. Part of them actually stemmed into full blown papers which will be included in the SEDA 2015 post-proceedings, others generated point papers and presentations which gave content to the SEDA two-day Conference.

All of them contributed to outline the conference debate and drove the attention to emerging concepts in "Agile" and "Security".

SEDA is a meeting space where Academia, Industry and Defense experts discuss their ideas on all the aspects of software manufacturing. All the point of views are represented: the user, the developer, the researcher and scientist. Differently from other Fora, not only pure scientific value is pursued but also practical implementation of existing methods and customers feedback. The SEDA 2015 Program Committee thanks all the authors for their lively and precious contribution.

The SEDA 2015 Program Committee

Title: ITA Army Agile Software implementation of the LC2EVO Army Infrastructure strategic management tool
Autors: Cristina Ventrelli, Dino Trenta, Stefano Salomoni, Davide Dettori and Vittorio Sanzari

The Army General Staff has identified the need for a strategic management tool for the numerous and widespread infrastructures belonging to the Italian Army. The generic requirement has called for various functions at different levels of information aggregation and fusion. The first attempt at finding a solution was based on the traditional software engineering approach which pointed out the difficulty of producing a high definition requirement document. A customized "SCRUM Agile" software development methodology was then implemented producing excellent results. The process is described with particular focus on the User Community-Development Team relationship and the evolution of the associated Product Backlog. Results on the software cost reduction and on user satisfaction are reported. A detailed description of the User Stories evolution through the various Sprints is presented as a case study.

Title: Make your Enterprise Agile Transformation Initiative an awesome success
Autors: Enrico Mancin

Organizations that want to seize market opportunities, or simply prosper in a long term timeframe, will need to accelerate their innovation and delivery while reducing time to customer feedback. Agile transformations are complex and if you are leading an Enterprise Agile Transformation initiative you are surely running into challenges not directly addressed by Agile Manifesto or by advices provided by expensive luminary consultants probably not agreeing each other. Enterprise Agile Transformation requires the application of agile and flexible principles through the software development lifecycle, as well as within the organization, to eliminate waste and delivery cycle time and unnecessary work, focusing on delivering value. Based on IBM real experience in successful large organization transitions this paper will focus on key aspects of enterprise agile transformation initiative and will help you on leading your transformation initiative at your organization in order to better prepare you to achieve a final success.

Title: Managing increasing User Needs complexity within the ITA Army Agile Framework
Autors: Franco Raffaele Cotugno

The innovations introduced in the Italian Army in Software (SW) Development Methodologies in the context of the "ITA ARMY AGILE" initiative requires attentive and tailored governance with due regard to the growth of the enterprise complexity and the future requirements related to the development of Command and Control systems. Starting from a limited approach centered on a single Integrated Development Team (IDT), an unprecedented growth of the product is being experienced due essentially to the fact that the customer has been "educated" and is now capable of stating its needs. Consequently, in the positive environment created and witnessed by the change of mentality, a brief description of the issues, chiefly but not solely linked to the scarcity of resources, time management and procedures complexity will be provided in order to take the whole LC2EVO (Land Command and Control Evolution) evolution under the expected control.

Title: Consumer Augmented Reality in Defense Applications
Autors: Cristian Coman, Pascal van Paridon and Franco Fiore

The paper presents an initiative to explore the potential of commercial electronics technologies in the military domain. Although the ruggedization, reliability and power consumption are challenges that prevent most of the hardware components from directly being used in operations, the consumer software components are confidently being used in operational military capabilities. The project has concluded that availability of advanced consumer electronics stimulates the development of new military concepts and supports software requirements elicitation.

Title: How Agile Development Can Transform Defense IT Acquisition
Autors: Angelo Messina, Peter Modigliani and Su Chang

Defense acquisition frameworks are often too large, complex, and slow to acquire information technology (IT) capabilities effectively. Large US defense IT systems average 81 month to develop, delivering capabilities that can be many generations old. Defense acquisition organizations for years have been concerned about the lengthy IT development timelines and given the pace of change in operations and technology, the issue must be addressed now. Over the last decade, Agile software development has emerged as a leading model across industry with growing adoption and success. Agile is centered on small development teams delivering small, frequent releases of capabilities, with active user involvement. From a planning and execution viewpoint, Agile emphasizes an iterative approach with

each iteration informing the next. The focus is less on extensive upfront planning for entire programs and more on responsiveness to internal and external changes, such as operations, technology, and budgets. Based on the above mentioned experiences on both sides of the ocean this paper discusses why the Defense Organizations should aggressively pursue Agile development adoption for effective IT acquisition (where suitable). This adoption requires changes to policies, processes, and culture, especially for development programs.

Title: Agile: The Human Factor As the Weakest link in the Chain
Autors: Ercole Colonese

Despite the excellent results achieved by the agile methodologies, software projects continue to fail. Organizations are struggling to adopt such methods. Resistance to change is strong. The reasons, related to the culture and people, are many. The human factor is the weakest link in the organizational chain. Many inhibitors prevent the adoption of good practices. C. G. Jung stated in 1921 "how difficult it was for people to accept a point of view other than their own." Based on his mental process, two American researchers, mother and daughter, have created the homonymous model: Myers-Briggs Type Indicator (MBTI). The tool helps us to understand ourselves and others: how to gather information from the outside, how to elaborate information and make decisions, and how to act afterwards. MBTI supports Agile in creating successful teams: better communication, share of leadership, effective problem solving, stress management, ecc. Psychological Types at Work, 2013 provides a guide to these items.

Title: Development and Engineering Engagement Platform - Balancing the dimensions in development environments
Autors: Gabriele Provinciali and Guido Campani

Beyond the methodologies and the software life-cycle management techniques, the human factor in a development team can be also represented in three main dimensions, such as integration (the level of technical coupling between developer and their tools), sharing (a common understanding and refinement of the best practices experiences in software development) and affinity (the propagation of common values to enhance the developers' collective intelligence). Human factor impact is heavily based on the concept of engagement: the paper will deepen the underlying implications of a common approach which allow to encompass integration, affinity and sharing using a developer engagement platform.
The platform enables skills, experiences and - mostly important - ideas generation based on reward mechanisms and continuous proposition-refinement-execution of new ideas.

Title: Agile and DevOps - Breakdown silos, create collaboration, increase quality and application speed
Autors: Alessio Livi and Francesco Colavita

The DevOps movement is gaining traction in organizations around the world because it is the best way to address many of the competitive challenges that enterprises are facing. It extends the most valuable aspects of agile development throughout the application lifecycle, removing the bottlenecks that slow down application development and delivery, reducing enterprises costs, improving satisfaction and reputation.
HP presents his framework DevOps based on a holistic approach that extends agile principles to the full enterprise, this will allow to:
• Eliminate silos across your organization
• Enable cross-team collaboration
• Automate build, test, and deployment processes
• Accelerate release cycles
• Shift left in the development process and test in production

Title: MBDA Extendible Command & Control
Autors: Christian Di Biagio and Pietro Piccirilli

The need to improve the timescale & cost performance of C2 weapon systems has lead MBDA to identify a new way to deliver C2 weapon system. An international MBDA team has been set up to identify commonalities in any Command and Control application within the Air Defence scope. This work led to an open architecture that encapsulates elements that depends on Weapon System specificities by the ones that are common. These common elements covering Surveillance, TEWA and Engagement Control functions within the wide MBDA's set of effectors, have been developed using MBDA Internal research funding and now are used to build up next generation C2 solutions.

Taking into account the threat evolution and the increasing operational demands, the 'MBDA Extendible C2' is a complete solution to improve the effectiveness of air defence products. By providing land and naval forces with open, modular, robust, interoperable and cost-efficient, 'MBDA Extendible C2' can help any Customer to extend their air defence capabilities to meet almost any threats and easily control the impact on C2 architecture due to an a evolutions in the Weapon System configuration.

MBDA has established and consolidated the product line approach through the identification of a set of reusable common core components for C2 capability including the Human Machine Interface and a continuously growing catalogue of components that can be integrated with them.

The extendible concept behind the framework architecture allows the use of the 'MBDA Extendible C2' during the initial phases of the contract (prototyping, derisking, demonstrator, research) and for the deployment phase by providing the possibility for close-loop feedback within the Customer.

The 'MBDA Extendible C2' is built on a framework architecture to manage the Core C2 Components, the Weapon System Specialized Components and the HMI Component, all of them are connected with a Publish/Subscribe middleware.

Title: DiSTERaP
Autors: Nazario Tancredi, Piergiuseppe Bruno and Stefano Alunni

This research activity aims to study and define a platform that allows to perform a process of "Rapid Prototyping" in the logic of design Model Base Design, allowing to significantly reduce development time. The approach developed allows to test models of the algorithms, made by the designer in Simulink™, directly on a Real Time test platform (prototype of OnBoard Computer) to evaluate performance, in terms of computational load. The most evident advantages compared to the traditional approach are those of reduce the risk of errors before integration (reduction of development time) and the ability to more quickly evaluate different design solutions in terms of performance and reliability. This logic of design allows you to put in the early stages of developing the OnBoard Computer inside the simulation loop (CIL - Computers In the Loop). The defined methodology allows to generate automatically, through the platform Simulink™, Embedded code and related makefile, send the generated files via Ethernet to a Remote Device (OnBoard Computer, etc ...) with operating system Linux, Real Time Linux, etc..., compile the project through makefile directly on Remote System and run it, all in a fully automatic and user friendly mode.

Title: Agile process for a Model Based System Engineering (MBSE) design
Autors: Christian Di Biagio and Pietro Piccirilli

MBDA has been working on MBSE since 2010. The MBSE methods is based on the use of SysML. The first step is the definition of the Use Cases (service provided to external actors, including operator but also other peer systems like effectors or remote command modules); each Use Case is an elementary service testable by its self on the System Under Design (SUD). The second step is the definition of the system architecture including the dynamic behaviour of the subsystems cooperating to build up the requested services. This process was experimented in an Agile context where people was regrouped in joint team and worked together to review the Use Case design. The Agile process supports the development by Use cases and the incremental consolidation of the contributes given by each subsystem up to their implementation. The Agile iterative approach was a tangible success while the incremental aspect was more difficult to achieve for complex system. The Product Line approach is seen a s possible solution. The Product Line approach provides a set of generic Use Cases and a generic architecture collecting best practices in a defined technological domain, so supporting i) Identification of the services required by the SUD; ii) An ordered implementation of the Use Cases by the SUD; iii) Opportunity to reuse for subsystems already available; iv) Design for reuse of the produced subsystem. The Product Lines represent an important part of the product backlog and it is a tangible help for the Scrum Master to identify the right priorities for initial sprints. In fact, the Use Cases supported by Product Lines are clear and mature enough to be worked out and the next iteration will provide an 'extension' of the previous delivered items.

Title: AMINSEP-Agile Methodology Implementation for a New Software Engineering Paradigm definition - A Research Project Proposal
Autors: Vincenzo Mauro and Angelo Messina

The application of the "Agile" methodology to a Military Application Software production line is not to be taken for granted. The adoption of the new production style has implied the solution of multiple problems and the generation of a custom version of the basic "Scrum" theory. One of the major changes has been imposed by the need to include Military Test Beds and Operational Units in the workflow.

Even if the "Agile Scrum" methodology has been around for over a decade now, and there are many successful

implementation stories the Italian Army experience clearly shows there is more conceptual work to be done. There are a number of open issues to be tackled and a growth potential to be exploited. AMINSEP tackles the area of Monitoring & measuring using noninvasive tools (Italian. Army choice) necessary to keep high the product quality level and monitor criticalities. Those tools need to evolve. The evolution has to take into account the peculiar environment of the agile teams. The current tools are based on complexity metrics borne for the old fashion software factories. The collected data do not give a complete picture of the team based code development cycle. A new set of metrics is needed to complement the existing ones. The basic concept and the structure of the Research Project is presented.

Title: Secure Boot on Mission Critical Platforms
Autors: Patrizio Boschi and Gianluca Grasso

This research activity was aimed at leveraging a modern technology and security standard, developed by members of the Unified Extensible Firmware Interface Forum, in order to enhance the security level of mission critical platforms. Secure Boot is a feature available on newer commercial platforms which can secure the boot process by preventing the loading of drivers or operating system loaders that are not certified through an acceptable digital signature. It is then possible to make hardware, firmware and operating system cooperate to thwart the efforts of malicious attackers. In this study, different scenarios and key elements for Secure Boot on mission critical systems are identified; a process is then provided both for its integration within an industry-level Operating System (FINX-RTOS), and for its insertion within a more broad industrial process and a "Chain of Trust" sequence which goes from power-on to application execution.

Title: Social aspects in implementing SCRUM Agile in a multidisciplinary Teams
Autors: Matteo Martello and Salvatore Labonia

Agile Software Development is a methodology for undertaking software development projects in which incremental functionality is released in smaller cycles (usually from 1 to 6 weeks), and work is performed in a highly collaborative manner by self-organizing teams, to ensure that customer's needs are truly met. The Army General Staff has decided to adopt a customized "Scrum Agile" methodology for their software production. The author's experience, about better communication and more collaboration among multidisciplinary teams for several sprints is reported. Team commitment on the short term goals and risks minimization is described. Positive feedback coming from being involved in product decision making, helping to shape how a product looks and works, are characterized as peculiar of an agile project. Some ideas on how Agile needs a change of mentality which might be hard to accept at the beginning, such as new processes, and new communication styles in place, are presented. In this paper pros & cons are discussed as a lesson identified in the ITA Army Agile environment. Tools and procedures are briefly described as well.

Title: "Cloud and Software Defined" Advanced application delivery models
Autors: Antonio Marotta and David Cenciotti

The request to ensure application Security, Compliance , High Performance and Optimization of User Experience is growing, and hand in hand that the information systems are open to logical virtualization and as-a –Service and Cloud paradigms. The Paper wants to go deeper into the unified delivery model of application services in the context of Cloud and Software Defined.
The application network becomes an essential piece for the security and quality of services.

Title: Security Evaluation of a Linux-based Operating System - An Industry Experience
Autors: Giuseppe Procopio, Patrizio Boschi and Gianluca Grasso

This paper aims to describe a project experience regarding the development of the Finmeccanica Linux Security Enhanced V4 (FINX RTOS SE V4, a GNU/Linux distribution) currently trough the evaluation process under the Common Criteria framework. The Evaluation Authority is the Consorzio Raggruppamento Europeo per la Sicurezza informatica (CRES) and the Certification Authority is the Organismo di Certificazione della Sicurezza Informatica (OCSI); the evaluation assurance level is the EAL4 augmented with flaw remediation. The FINX RTOS SE V4 is being developed with security in mind in order to make it able to face or to reduce significantly the impact of cyber-attacks, preserving integrity and ensuring availability and confidentiality of assets as well as of the FINX RTOS SE V4 itself. Security features of the FINX RTOS SE V4 such as advanced authentication, isolation of subjects, actions, and resources, strong encryption, intrusion detection, trusted applications, and security auditing, shall be reviewed by external and independent auditors. The objective is to provide assurance that the process of specification, implementation and evaluation of the FINX RTOS SE V4 has been conducted in a rigorous, standard

and repeatable manner at a level that is commensurate with the target environment for use. The certification process for the FINX RTOS SE V4 started in February 2015, and it is expected being awarded at EAL4+ by the end of 2015.

Title: AMD - Agile Model Driven approach for Functional Oriented Simulation Engine: TheScribe a real project experience
Autors: Luca Recchia and Fabrizio Gori

On complex systems development, the design phase has high probability of defects that lead to evolution and refinement of system specifications. Because of that Agile software development methods seem to be even more necessary in industry context where requirements and solutions evolve through collaboration between self-organizing, cross-functional teams [A]. Since 2004 [B] until now, to face software defects at the early development phase of the project, model-driven code generation has been investigated in traditional and object-oriented design paradigms; significant progress has been made. Model Driven development offers many advantages including the rapid development of high quality code. Errors are reduced and the consistency between the design and the code is retained, in comparison with a purely manual approach [C].
Here, a model-driven code generation approach is proposed able to ease early delivery, continuous improvement, and to encourage rapid and flexible response to change.
The approach has two main transformation activities. The first activity transforms a graphical model (draft) of the design into a formal, XML based, notation. The graphical draft of the model is created by the software designer with the use of a state diagram that describes the software to be developed. The second activity transforms the XML meta-models of the previous transformations into a UML profile that provides model elements such as Classes, Attributes, Operations, etc. specific for the simulation engine under development. At this point the developer has virtual classes (strategies) generated having in mind the simulation engine domain. Now it's time to start to deal with source code: override strategies and code capabilities requested to the software under development.
The approach proposed has been used on TheScribe a Functional Oriented Simulation Engine generator that is in use on MBDA Italian projects; advantages of the approach and considerations are presented in the paper.

Title: Pair Programming and other Agile techniques: An Overview and a Hands-On Experience
Autors: Marco Stella, Francesco Biscione and Marco Garzuoli

Although Agile programming methodologies are still relatively young, it is already possible to draw up an initial assessment of their potential outcome. This article provides a historical overview and a short description of these programming techniques and their relevant key tenets. Besides, based on several years of application, a practical point of view is provided, identifying the key points that demonstrated real long-term effectiveness, as well as the unavoidable deviations from the theoretical model.
At last, an interesting example of a practical application is given, regarding the development of a speech-recognition based squelch algorithm, suited for radio communications especially in the noisy HF range, useful for defense and security applications. In this case, not only has the application of Pair Programming led to the rapid integration of a newcomer in a well-established work group, but it also led to a simple and practical algorithm, reliable, easily implementable both in hardware and software, and with very promising performances: the voiceXtract(TM).

Title: Shu-Ha-Ri: How to break the rules and still be agile
Autors: Antonio Capobianco

Fata Informatica is a software house that produces a commercial system widely used by Defence Organizations. Our first approach to software development was standard waterfall, but during the years our team adopted an agile driven approach. The agile adoption was a long sweaty path that lead us through the Shu-Ha-Ri Aikido stages and let us implement our own agile framework. In this contribution will be shown as Fata Informatica's team defines the product increments that add the more value to the customers, how they develop and deliver them into the market. A description of our value and cost evaluation and the way we choose which increments add to a specific delivery, Fata Informatica's agile approach to the stakeholder engagement and how the static roadmap concept is outdated by a more agile roadmap definition approach will also be shown in order to meet the increasingly needs of our stakeholder.

Title: Expressing, managing and validating User Stories: experiences from the market.
Autors: Carlo Pecchia, Marco Trincardi and Pietro Di Bello

Agile methodologies for software development favor customer involvement and thus a rapid feedback cycle on realized product increments. Such involvement is implemented in the activities around Requirements (elicitation, analysis, development, management, change, validation) which in turn are often sustained by - and expressed in - "user story" format.
This paper aims to show our experience in developing software system representing functional requirements mainly with "user stories", and capturing also non-functional requirements (eg: availability, security, etc) in demanding domains.
This paper starts defining what a user story is, how we write and test it, and what are main differences compared to "traditional" documented requirements and use cases. Then it focuses on techniques we use for splitting and grooming, and how we transform a linear backlog into a multi dimensional Story Map that help us to manage size and complexity.

Title: Supplementing Agile Practices with Decision Support Methods for Military Software Development
Autors: Luigi Benedicenti

The literature shows that under certain conditions, traditional software development processes benefit from the adoption of structured decision support methods. Agile methods usually eschew this approach in favor of a collaborative decision-making structure. In the domain of defense software, however, a hierarchical structure is inherently present. Thus, the introduction of a more structured decision support method in agile development should lead to a higher level of comfort with the products built this way.
This paper provides the foundation to adopting decision support methods as derived from past experiences at the University of Regina and grounds it in the defense software domain. The paper contains findings on insertion points for decision support methods and the methodology followed to evaluate which of these methods are the most appropriate. It also summarizes the lessons learned during the work conducted at the University of Regina and in selected industrial settings.

Title: MBDA Collaborative Environment (CEM)
Autors: Marco Ronchi, Francesco Giammarino and Christian Di Biagio

The CEM (MBDA Collaborative Environment) solution is a collaborative engineering environment whose purpose is to deliver specific project's complex operational needs by enabling all team members to access the same single design artefact in any of the tools. This is the first time that a complex set of systems engineering development tools for requirements, design and configuration management must work together in integrated and collaborative environment, distributed across multiple MBDA Nat Co's (Italy and UK). This solution integrates the following SW tool: VMware Horizon, IBM Rational applications, Specific NSA certified SW. Moreover this environment is protected, which therefore enables the efficient sharing of restricted data between Italy and the NSA approved entities. This environment is a virtualization-based technology that creates a cohesive and scalable environment and centralises the Italian IT infrastructure. The project provides a solution that includes the components HW, SW and services required for the deployment of the entire infrastructure. The hardware is based on the HP Blade System c-Class. The identified software solution is based on virtualization technology VMware Horizon View. This solution allows each user of the project to work in a 'cloud' environment oriented to collaborative development. This reduces development time as it allows real time development and review of design artefacts, reducing the risk of duplication of effort. It reduces development risk of mis-understanding due to parallel development activities. Then it reduces time and costs of IT setup and management, and shipment time and cost. The CEM will be used to experiment Agile distributed team collaboration.

Title: Benefits of Open Source Software in Defense Environments
Autors: Daniel Russo

Even though the use of Open Source Software (OSS) might seem paradoxical in Defense environments, this has been proven to be wrong. The use of OSS does not harm security, on the contrary it enhances it. Even with some drawbacks, OSS is highly reliable and maintained by a huge software community, thus decreasing implementation costs and increasing reliability. Moreover it allows military software engineers to move away from proprietary applications and

single vendor contracts. Furthermore it decreases the cost of long term development and lifecycle management, besides avoiding vendor's lock in. Nevertheless deploying open source software deserves an appropriate organization of its lifecycle and maintenance, which has a relevant impact on the project's budget that cannot be overseen. In this paper we will describe some major trends in OSS in Defense environments. The community for OSS has a pivotal role, since it is the core development unit. With Agile and the newest DevOps methodologies governmental officials could leverage OSS capabilities, decreasing the Design (or Technical) Debt. Software for Defense purposes could perform better, increase the number of the releases, enhance coordination through the different IT Departments (and the community) and increase release automation, decreasing the probability of errors.

This paper claims five main issues about the benefits of the use of OSS in Defense environments: Cost, Innovation, Delivery, Security and Agility.Some of these issues appear pretty straightforward, like the cost issue. In fact the use of OSS decreases (or eliminates) contractor's monopoly regarding the exclusivity of the required capabilities. Furthermore innovation is fostered, since Defense officials have more time to focus on their core business and not to code (which is done by the community). Similarly, also the delivery is improved, because military software engineers can focus on changes and integration of existing software capabilities, instead of having to redevelop entire software systems. Time management is optimized to deliver new capabilities which relate more with the core business. It has not to seem strange that also the security is enhanced through a peer reviewed and reactive community. Furthermore a broad access to the source code enables software security even after the release. Likewise, software development is agile, since there is no copyright infringement (since the OSS is licensed by the Defense agency or the Government) so it is easy for all departments to use clones (piece of codes) to set up their own systems, without any copyright infringement. It is like a public library, where any official can just pick what he needs to build his system.

DevOps is a growing software engineering methodology to assure a better integration of the Development, Quality Assurance and Operations Department, in order to optimize the quality and the number of releases. This is, for instance, crucial in a dynamic environment where features have to change very fast (like a battle environment). Furthermore, optimizing the releases decreases also the Design Debt, which is very typical of Scrum methodologies. After an explanation of the (ii) background, this papers points out that the OSS community can lead to enhance several benefits for software development (iii) and software optimization through the newest methodologies (iv). In conclusion (v) we suggest further research in reference to the European defense software development system.

Title: Self-validating bundles for flexible data access control
Autors: Pierluigi Gallo, Andrea Ando' and Giovanni Garbo

Modern cloud-based services offer free or low-costs content sharing with significant advantages for the users but also new issues in privacy and security. To protect sensitive contents (i.e. copyrighted, top secret, personal data, etc.) from the unauthorized access, sophisticated access management systems or/and decryption schemes have been proposed, generally based on trusted applications at client side. These applications, work also as access controllers, verifying specific permissions and restrictions accessing user's resources. We propose secure bundles (S-bundles), which encapsulate a behavioral model (provided as bytecode) to define versatile standalone access controllers and encoding/decoding/signature schemes. S-bundles contain also ciphered contents, data access policies and associated metadata. Unlike current solutions, our approach decouples the access policies from the applications installed in the user's platform. S-bundles are multi-platform, by means of trusted bytecode executors. They offer data protection in case of storage in untrusted or honest-but-curious cloud providers.

Title: Secure application cloudification with Docker
Autors: Silvio Bologna, Filippo Millonzi, Diego Terrana, Gianluca Zangara and Pietro Paolo Corso

In recent years we have witnessed the increasing need of computational power in order to address more and more challenging tasks such as ubiquitous computing, Big Data Analytics and Business Intelligence. It is thus crucial to use at the best the available resources, also allowing heterogeneous systems to cooperate as a whole. Since many years virtualization represents a valuable solution for this challenging purpose. The advent of Cloud Computing, meant a cooperative extension of virtualization technologies, makes it possible the effective deployment of entire application frameworks upon a redundant infrastructure with minimal effort for moving instances, changing provider and replicate data and applications. Most of the currently used Cloud Computing stacks are strictly based on traditional virtualization technologies, thus having a strict separation of virtualized environments that involves a considerable overhead in terms of resource utilization and time consuming to start new services. Containers are a consolidated Linux technology that allows executing processes in a separate user space by sharing the same kernel. Docker is a recent project using Containers to make an orchestrated layer for deploying Container images. Container virtualization is not secure as hypervisor virtualization since processes share the same kernel and sometimes the same physical devices. This paper presents a review of some solutions to increase the Container virtualization security, ranging from manual configuration of the host to the use of resource-tagging technologies such as SELinux and AppArmor.

Title: A Big Data Architecture using Hadoop and Linux Containers
Autors: Alessandro Bruno, Francesco Cangemi, Pietro Paolo Corso, Davide Emmolo and Gianluca Zangara

Big Data is driving radical changes in traditional data analysis platforms: the volume and the heterogeneity of data, together with the speed at which they are generated makes it difficult for current platforms to scan, analyze and manage nowadays huge amount of generated data. GIS (Geographic Information System), machine learning, knowledge systems, ontologies, social networks, often need to be turned into useful information for many tasks. One of the objectives of software engineering research applied to Big Data Analytics consists in the development of innovative platforms providing manageability, resource utilization, security, scalability and in the satisfaction of users' requirements in a reasonable amount of time, if not in real-time. In this paper we give an overview of the architecture solutions for Big Data Analytics, such as Hadoop, Spark, Graph Databases, Twitter Storm. We specifically focus our attention on Cloud distributed computing architectures to improve the performance of Big Data Analysis systems. Finally, we investigate the integration of Linux Containers technology architectures and Apache Spark as an innovative solution for approaching and extending existing Big Data Analytics platforms.

Title: Agile Software Development: A Modeling & Simulation Showcase In Military Logistics
Autors: Francesco Longo and Stefano Iazzolino

The Simulation can provide the groundwork to assess and validate the effects of agile practices and in turn can substantially strengthen its methodological foundations benefiting from advances and best practices in software engineering. Being centered on the concept of customer involvement, agile practices meet one of the key requirements in a simulation study, indeed customers can provide meaningful insights and domain knowledge that the modeling and coding phases could substantially take advantage of. Moreover when dealing with human factors, another crucial concept is that "individuals and interactions are more important than processes and tools". This concept meets the need to consider the many issues, related to development processes, under multiple perspectives to find out the best solution. It can be achieved thanks to a multidisciplinary and cohesive team where cross-domain interactions, knowledge exchange and effective communications occur. In such cases the ability to detect a solution, able to combine different perspectives and approaches, goes beyond the expectations resulting in worthy valuable outcomes. It fully applies when simulation seeks to capture the behavior of real complex systems where many interacting components and non-linearities are called into question (e.g. military systems). Thus human factors in agile practices are mainly related on managing internal and external relations and communications. In both cases the main concepts and principles apply both in software and simulation development effortlessly. As for technicalities, being much focused on the deployment, quality, reliability and reuse, both M&S and Agile Development leverage adaptivity and iterativity that are pillars in the agile development theory and driving requirements in M&S projects confirming the idea that, when developing a simulation-based application, best practices can be found out thanks to agile development. To this end, a case study in military logistics will be presented in the full paper showing that high quality results can be achieved applying agile techniques for simulator development.

Title: A New Methodology For High Accuracy Measurements Of The Hardness Depth Profile In Steel Mechanical Components In Vehicles
Autors: Roberto Li Voti, Grigore Leahu and Concita Sibilia

A novel methodology based on photothermal radiometry and infrared thermography is here developed and validated for the NDE & NDT of steel mechanical components for civil and military vehicles. Such a methodology is useful for a fast nondestructive and noninvasive inspection of the hardness, of the effective cementation depth, of possible lack of cementation, together with some thermal and mechanical related quantities. In this paper we give a detailed description of the hardware and software of the instrument, which can be easily automatized with the AGILE methodology application.
The results show the relevant impact in the field of quality control of mechanical components used in many military sectors.

Title: Modeling, Simulation and Serious Games for Crowdsourcing: an Interesting Framework for Applying Agile Paradigms
Autors: Agostino Bruzzone and Giulio Franzinetti

Technologies are enabling, along last years, a wide spectrum of new applications; for instance web applications and cloud approach are generating many new services, while mobile solutions allow accessing them from everywhere; these elements are diffusing the use of computers over a large community and wide spectrum of applications: as results of these elements the number of software services and users are growing very fast generating an huge amount of valuable data.

These phenomena affect also M&S (Modeling and Simulation) sector; in particular since beginning of this millennium the combination of game paradigm with simulation methodologies is evolving and, recently, it was consolidating as MS2G (Modeling, Simulation and Serious Games): this approach combines these two sectors in order to develop a new generation of interoperable, flexible and intuitive simulation models.

In facts simulation is more and more popular, while often the users request directly these solution for training, decision making and capability assessments; obviously this popularity is resulting also from cultural evolution in user communities. Therefore these phenomena are due also to the M&S successful achievements along last years that resulted also in creating new generations of reliable models; obviously these achievements are based on the evolution of M&S methodologies that are continuously improving simulation development processes (e.g. times and costs) and to the ICT infrastructures able to enhance the simulation capabilities on large and complex systems improving user interface and data availability.

Standing these conditions MS2G needs to address the major M&S challenges: VV&A (Verification, Validation and Accreditation) and Fidelity/Usability. In reference to these issues, by focusing on user engagement, the Serious Game paradigm allows to extend the experimentation and testing phase over a larger community, eventually adopting mobile approach that further reinforce utilization opportunities; vice versa the M&S elements of MS2G focus on the concept of interoperability guaranteeing that the new simulators will be ready for act as part of dynamic federations involving other models as well as real equipment.

These innovative aspects of M&S concepts are supporting the diffusion of Crowdsourcing applications: a new way to use simulation devoted to provide an interactive virtual world to a distributed community able to conduct many experiences and experiments leading to a collaborative distributed cognitive capability; many people could test their assumptions and ideas and compare results with others, in a way they are "crowdsourcing" new solution to complex problems; these applications have been successfully applied in several sectors such as Defense, Pharmaceutics, Town Management.

Obviously the synergy of MS2G applied to crowdsourcing is enormous and the authors developed, along last years, several applications devoted to Power Management, Urbanization, Homeland Security, CBRN, Space, Logistics etc.

From this point of view it result evident the fact that several of the Agile Software Development Paradigm are nested in this context: User / Developers Interaction, Dynamic and continuous evolution of the solutions, interactions among individual over the processes; these elements belongs to Agile Programming as well as to Crowdsourcing and MS2G. Due to these reasons the authors will present in this paper different cases of simulators devoted to crowdsourcing developed by Simulation Team into an international context; the paper will include an evaluation of critical issues, benefits and potential for further developments related to synergy between MS2G and Agile Programming.

Title: Software characteristics for Program Forza NEC main systems
Autors: Angelo Gervasio

The Program FORZA NEC is the main Defence Land assets' digitization program, which started in 2010 with a CD&E phase and is going to last until 2018. The results of the CD&E will be the pillars of the future digitized Italian land and amphibious assets.

The Forza NEC architecture encompasses C2, Communications, ISTAR, effectors, modeling&simulation, UAV/UGV and other digitized high technology systems capabilities. Software applications are the element that enable the functionalities of most of the NEC systems, with particular regard to:
- command posts (SIACCON -> LC2EVO);
- tactical mobile platforms (SICCONA);
- soldier platform ("Soldato Futuro" C2);
- information management and information security systems (MILS Gwy).

These assets must operate in unstructured, unsafe environment characterized also by wide range temperature, various terrain and all weather conditions. To allow full functionalities in this environment, all the military systems' components must have peculiar characteristics and must comply with specific and robust standards. As one fundamental components of military systems, the software for defense applications must follow all the foreseen standards and have the following main characteristics:
- high reliability;
- configuration control;
- high level of security;
- maintainability;
- user friendly;
- standardization;
- upgradability, also to different development techniques/sw languages/operational systems.

Title: Data Breaches, Data Leaks, Web Defacements: why secure coding is important.
Autors: Raoul Chiesa and Marco de Luca Saggese

The document provide a "big picture" towards those main threats linked with information theft and leaks, and web defacements, along with those consequent impacts on organizations.
The second part of the talk will focus on the importance of the so-called "Secure Programming" and on those average mistakes that pop up when running security testings and advanced Penetration Testing activities towards web applications.

Title: Agile plus new Army diffused and shared leadership
Autors: Carlo Pasqui, Antonio Francesco Muschitiello and Stella Gazzerro

The Integrated Development Team#4 was set up with the objective of developing the Functional Area Service related to the Joint Intelligence, Surveillance and Reconnaissance, which is a peculiar competence of the Italian Army ISTAR-EW Brigade.
Based on the Agile Methodology, the close communication and the continuous interaction with the client enabled the team to become familiar with the complex concepts related to the IPB preparation.
The "C3 - Command, Control and Communication" that is a pillar in the military art of leading is provided by Jazz Platform that is the core of Collaborative Approach founded on Agile and supporting the speed of the participants, the coordination of their effort and perhaps most importantly the communication between the developer, scrum master, stakeholder and Product Owner although on geographically distributed areas. Every team member is continuously aware about the team shared goal and the work progress in real time. The toll provides cost monitoring and workload optimization as well.
To sum up, the team-centric nature of this method as well as the peculiar military tendency to focus on group dynamics ensured to build a close-knit team, willing to tackle the challenges that will be arising throughout the next few sprints.

Title: Capturing User needs for Agile Software Development
Autors: Angelo Messina, Roberto Marsura, Stella Gazzerro and Stefano Rizzo

Agile methods have proven their ability to improve project success rates. However,when agile methods are applied to complex military projects, an express need to further explore the area of effective stakeholder involvement comes out. According to the agile philosophy, the users must be part of the development team but what is the correct way to deal with hundreds of users with good ideas, strong desires, different cultures and languages, sometimes dispersed around the globe and around the clock? Can a single Product Owner really represent all their interests and translate their desires into working solutions? How is it possible to stay Agile enough when dealing with the many existing regulations? The lessons identified working with the Italian Army General Staff show how to successfully use Agile methods based on user stories collections in place of traditional requirements elicitation approaches.
Looking at the future, the paper describes the focus of a new research activity based on automated Semantic discovery of hidden relationships to support a strategic decision making process.

Title: The AGILE methodology in Progesi: MDA Model (Meta – Dynamic – Agile)
Autors: Roberto Bizzoni, Marco De Angelis and Massimo Trentini

This paper introduces a new method that combines the AGILE aspects with the concepts of the CMMI L3 certification: the MDA Model. This model is a project management method devised and used in Progesi over the last few years in order to manage various aspects of the company process.

For more than 35 years, Progesi has made a name for itself in the defence and space industry thanks to many collaborations with the most influencing actors in this market.

Having gained a lot of experiences in this field through its more than 200 experts (90% of whom hold a degree in Engineering, Maths and IT), Progesi manages independently medium complexity and size projects and supports its strategic partners in large projects at national and international levels. The diversity and complexity of the scenarios encountered have entailed an evolution of Progesi's organizational processes over the time. As a consequence, Progesi has received several certifications such as ISO:9001, ISO:14001, ISO:18001, ISO:27001 and CMMI level3 in 2013.

Not only has this evolutionary impulse driven Progesi towards a strengthening of the business processes in order to define and harmonize the activities of more than 200 specialists, but it has also inspired the study and the introduction of new project management methodologies and their life-cycle in line with the AGILE method. Although the approach might seem to be in contrast with the process as defined in "CMMI", this methodology is able to answer the business needs optimizing the resources and the company's skills.

The methodology called MDA (meta-dynamic-agile) has been developed over the time and it is constantly evolving (it is compliant with the IDEAL cycle of the CMMI). Its key points are:

• Cross-action in the implementation of the method in various aspects of the company; from the production to the management control and the organizational services (meta)
• The dynamicity of the approach (dynamic) that it matches the current situation
• The principles of the methodology AGILE, particularly with regard to the close collaboration with the client (agile)

The real reason for adopting a methodology AGILE comes from the increasing requests of the clients to have quick software releases, which should not be based on strict and specific requirements at the beginning of the project, but they should keep the objectives of quality, cost and reliability of the waterfall life-cycle of the project (Are they still used?). In this scenario, the fulfilment of the different phases of the process and the expected deliverables for each Process Area of the CMMI has proved to be intractable: while on the one hand (client side), there was the need to provide quickly releases and prompt changes of the requirements; on the other hand (Progesi side), there was the commitment to implement the process as specified, controlling every activity through the delivery of the documentation provided for each phase and its analysis. The adoption of this method, which is described in details in the following paragraphs, allows Progesi to guarantee an effective response to its client requests and to keep the control and the consistency of the adopted process in compliance with the business processes.

Title: Role of Design Authority in large, Scrum of Scrum, multi-Team based programs
Autors: Giovanni Arseni

The Paper discusses the vital role of Design Authority (D.A.) in large, Military Scrum of Scrum multi-Team based programs, making sure systems shall support a military operation according to organizational and administrative procedures. It's established that multiple teams and progressive technology can create a thwarting environment leading to implementation fatigue; finding balance between agility vs. standardization or functionality vs. usability create conflicts among stakeholders. The D. A. shall manage these problems, maximize opportunities, taking the responsibility for ensuring a solution that meets goals, needs and specifications during the entire Agile process. A discrete D. A., sprint-by-sprint, acting in coordination with Teams, defines and communicate portfolio vision, technical strategies, architecture standards and design methodologies. D. A. maintains an end-to-end view, using a mission focused perspective, ensuring to deliver business value, providing timely and useful information to Team-members and Stakeholders; absence of a D.A. yields uncertainty among project participants on their task and role.

Title: Contractual settings in support to the SW development applications for Defense purpose with the "Agile SCRUM" methodology
Autors: Fabrizio Messina and Giovanni Muccio

Guidelines on the quality of goods and ICT services for the definition and the government of the contracts of the Public Administration

Title: Dev-Ops implementation cookbook
Autors: Francesco Colavita

The DevOps movement is gaining traction in organizations around the world because it is the best way to address many of the competitive challenges that enterprises are facing. It extends the most valuable aspects of agile development

throughout the application lifecycle, removing the bottlenecks that slow down application development and delivery, reducing enterprises costs, improving satisfaction, results, and reputation.

HP presents his framework based on a holistic approach that extends agile principles to the full enterprise; this model can help private and public companies to speed up the transformation and:
- Eliminate silos across the organization
- Enable cross-team collaboration
- Automate build, test, and deployment processes
- Accelerate release cycles
- Shift left in the development process and test in production

Title: Clinical Advisory Board: development of an Electronical Medical Record through an agile approach
Autors: Natalia Pianesi and Paolo Pesaresi

The project adopts an original agile approach for the development of a truly mobile Electronic Medical Record.This approach is based on the wide and innovative involvment of the Clinical Advisory Board in the whole development process, in order to constantly aim at fulfilling and maximising the User Experience. Therefore, the EMR 2.0 has been built through a metodology that matches the user experience design principles for the health care sector(together with an agile approach to the software development process.