DASA DEVOPS AGILE SKILLS ASSOCIATION

ACTIVE LEARNING DELIVERING BUSINESS VALUE

Paul Wilkinson (GamingWorks)

This white paper was developed through collaboration between the DevOps Agile Skills Association (DASA) and GamingWorks, a company which develops and deploys professional business simulations aimed at supporting organizational change. GamingWorks is based in the Netherlands and was founded by Paul Wilkinson and Jan Schilt.



In a recent article entitled 'DevOps Has Reached "Escape Velocity", CIO's Need To Get Onboard' Robert Stroud of Forrester stated - "To unlock the promise of DevOps, CIOs must lead and support a cultural change within their technology management organization. As any leader knows, changing institutionalized behavior is the toughest of all management challenges and CIOs are understandably skeptical of new trends. Despite this, CIOs must recognize when a trend becomes an imperative for survival. DevOps has become this imperative, and CIOs must engender a culture of collaboration and learning and enable their people with the right tools to drive holistic lifecycle automation"

Source: http://blogs.forrester.com/robert_stroud/17-05-20-devops_has_reached_escape_velocity_cios_need_ to_get_onboard As a result of this imperative more and more organizations are looking to invest in and develop their teams DevOps capabilities. On the one side this means developing the right knowledge and skills and on the other side this represents a real Cultural transformation – The need to break down 'SILOs', improve communication & collaboration between individuals and teams who are focused on delivering business value, not just technology solutions.

This white paper explores the DASA Competence Model, showing the types of skills and knowledge areas that must be learned, and explores how Experiential learning, in the form of a Business Simulation, can help participants:

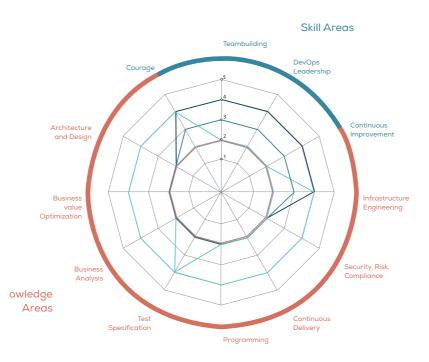
- Translate DevOps Theory into Practice
- Support a Culture Change
- Overcome Skepticism
- Foster and Enable Effective Collaboration
- Empower Teams to Change

STATE OF DEVOPS REPORT 2017

Improving quality is everyone's job. High-performing organizations spend 22 percent less time on unplanned work and rework. As a result, they are able to spend 29 percent more time on new work, such as new features or code. '...The DevOps mantra of continuous improvement is both exciting and real, pushing companies to be their best, and leaving behind those who do not improve'.

SKILLS AND KNOWLEDGE AREAS

DASA developed a competence model to help organizations assess their current DevOps competency gap. The model reflects the vision that the role of the IT engineer will become more generic as DevOps teams develop. Any member of the team can roughly do the job of another. The key to working in this environment is to recognize that there is a skills and knowledge set that needs to be present in every DevOps team. The distribution of these skills and knowledge may be different per team. However, each team will need to ensure they deliver the service as required by the customers of that service. The competence model helps organizations assess their level on the scale of 'Novice, Competent, Proficient, Expert and Master,' and looks at 4 key 'Skills & Behavior Areas' and 8 'Knowledge Areas'.



1. Novice / 2. Competent / 3. Proficient / 4. Expert / 5. Master

SKILL

- 1. **Courage:** Evangelism, coaching, self-confidence, proactivity, reflection, trust, open discussions, experimentation, fail fast, courage to change.
- 2. **Team Building:** Understand the other's point of view, collaboration, mutual accountability, common purpose, ability to integrally support the service/product.
- DevOps Leadership: Facilitating teams to high performance, humility, transparency, service lifecycle mindset, stakeholder management.
- Continuous improvement: Today we do our work better than yesterday, Kaizen mindset, quality at the source, first time right, knowledge-sharing, ability to adapt.

KNOWLEDGE AREAS

 Business Value Optimization: Use of the IT service in real life, including direct feedback loop of user comments to team, service level management, definition of done, business activity/ performance monitoring, business case management.

- 2. Business Analysis: Functional requirements, non-functional requirements, longer term development of business process (based on translation of market developments), data analysis, and refinement.
- 3. Architecture & Design: Ensuring fit between developments and current situation, overall service design, patterns & styles.
- 4. **Programming:** Software engineering mastery, everything as code, data management.
- 5. Continuous Delivery: Automated testing, deployment and release management, configuration management, version control, cloud, containerization, featuredriven delivery.
- 6. **Test Specification:** Design of test cases, test concepts.
- Infrastructure Engineering: Technical monitoring, performance management (e.g. load balancing etc.), capacity and availability management, reliability engineering, cloud, containerization.
- 8. Security, Risk & Compliance: Security, service continuity planning.

STATE OF DEVOPS REPORT 2017

Employee engagement is not just a feelgood metric – it drives business outcomes.

EXPERIENTIAL LEARNING

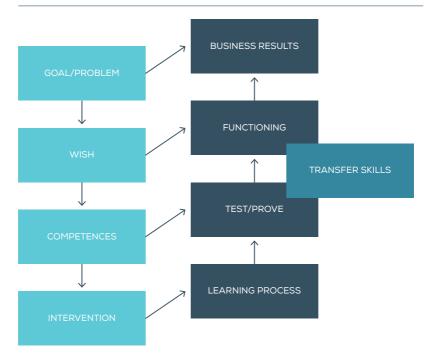
GamingWorks has developed a business simulation, 'The Phoenix Project', based upon the case represented in the best selling book, The Phoenix Project, written by Gene Kim, Kevin Behr and George Spafford. The simulation is a form of experiential learning or 'learning-by-doing'. GamingWorks and DASA are working together to incorporate the business simulation as a practical exercise within the DASA qualification program, helping delegates explore, experience and develop the knowledge and skills underpinning the DASA competence model.

MOVING FROM THEORY TO PRACTICE

At GamingWorks we see many organizations sending their staff on Foundation level training such as the DASA DevOps Fundamentals and then assuming delegates are competent in being able to apply what they have learned. This is what the majority of organizations did with ITIL® training. Our surveys revealed that 70% did not get the anticipated for return on value from their investment. We believe applying continual learning to this situation will help individuals learn by doing and ensure their organizations DevOps training investment delivers the value they expect. Below are four key reasons for failing to realize value, based upon feedback from customer organizations that participated in our survey:

- One reason for not obtaining value was the 'inability to translate theory into practice'. Failing to have enough practical exercises to test the theory. A business simulation provides this practical assignment, allowing people to translate theory into practice in a number of game rounds.
- A second reason was the 'failure to apply training end-to-end'. The true value of adopting and adapting best practices lies in effective collaboration which can not always be realized with a theoretical certificate or by sending individuals to open training or individual elearning. A Business simulation can be used to bring the end-to-end stakeholders - including the Business, Developers, Security, Testing and Operations - together to learn how to collaborate effectively in a practical setting.

- A third reason is lack of 'transfer of learning' which encompasses transferring what was learned back into the workplace. A business simulation can be used to 'capture and agree upon improvement actions to take-away', which should be incorporated into a structured approach to learning such as applied in the 8-Field model. *Source: http://www.gamingworks.nl/explaining-the-8-fields-model/*
- A fourth reason is failing to recognize that best practice adoptions represent 'iterative improvements' – no organization has ever implemented best practices from zero to optimized maturity in one go. This means that continual learning and improvement is a core capability. Often too little focus is spent on developing these capabilities. A business simulation is played in a number of rounds. The team must learn themselves, with coaching from the facilitator, to apply their own reflection and improvements – developing continual improvement capabilities.



8-Field Model

DEVOPS IN ACTION: THE PHOENIX PROJECT SIMULATION

The Phoenix Project business simulation is a dynamic, classroombased, interactive workshop. A team of players are assigned roles and responsibilities and placed in a realistic environment in which they must effectively communicate and collaborate applying DevOps practices and principles in order to succeed. The simulation is played in a number of rounds. At the end of each round the team must demonstrate performance improvements in terms of number of deployments, successful deployments, resolution effectiveness and business value realized. Between simulation rounds the team learns to reflect and apply continual improvements.

At the end of the simulation, delegates are asked: 'What did you apply today in this simulation exercise that you now **need** to take away and apply in **your** organization?' We have mapped these key takeaways back to the DASA Competence model to show how the simulation can support and enable skills and Knowledge development that reinforces DASA's training objective to build high-performing IT Teams.

SKILLS & BEHAVIOR AREAS LEARNING BY DOING

COURAGE

- Self confidence Everybody has the right to say stop! Either the flow isn't working, communication isn't clear or help is needed. The team then swarms the issue until it is solved. If a structural improvement is needed to prevent the issue happening again, an improvement item is added to the Visual Continual Improvement board.
- Courage to change You make it you manage it. Ensure manageability is built in. The same team should be responsible for fixing failures after go-live. Knowledge must be shared and transferred into Incident management capabilities.

- Trust No blame. Failure is an option. So long as we learn from it and can prevent it from happening again. Blame kills the open, learning culture. Leaders must help foster a no blame culture.
- Open discussions Communications discipline. No assumptions. Listening, letting people have their say. Confirming understanding and agreements. Seeking and accepting feedback. Openly reflecting on performance. Ensuring that visual management systems provide relevant information.
- Experimentation Limit work in progress/single piece flow. Don't do too many things at the same time, mistakes occur and people get frustrated. Practice single piece flow vs multi-tasking and evaluate throughput time, rates and errors.

SIMULATION EXPERIENCE

As the team started preparing their work and discussing how they will apply DevOps principles the lead engineer in the game said to me '...I'm not just going to give my knowledge to IT support', declaring this is what he hears in his organization. On the one side, knowledge is power, and on the other side there is little collaboration and trust with support. Clearly signaling one of the core critical success... AND fail factors of adopting DevOps. It represents a significant change in culture and collaboration.

TEAM BUILDING

- There needs to be a consultant/coach in all new DevOps teams to help them learn to self-organize, to be able to reflect and capture iterative improvements to be able to manage stand-ups, to be able to design, use and manage a visual management capability – Self organizing teams don't happen because you simply press the 'install self-organizing teams' button!
- Visual Management System. Built together by team.

DEVOPS LEADERSHIP

- A culture for sharing knowledge, daring to say, 'I don't know', investing in creating new skills and cross functional teams. No more 'hero' culture.
- T-shape skills not just technology skills. 3:1, 1:3 (meaning 3 people should be able to perform 1 team task, and 1 person should be able to perform 3 separate team tasks). This includes 3 people who can run a stand-up and a reflection session. This can be anybody in a team. It doesn't have to be a manager. A manager 'telling' can kill 'open feedback and exploration and experimentation'.
- **Empowering teams to change.** Fostering ownership and a culture of continual learning and improvement.

CONTINUOUS IMPROVEMENT

- Teams need to reserve time for reflection and improving their work. DevOps doesn't happen overnight. It will require trial, error, experimentation, learning and improvement. "Improving your work is just as important as doing your work".
- Visual management. Should contain visualization of improvements to be made in the way of working, not just visualization of work to be done.
- Service management needs to be included. E.g., Problem management can enable feedback and help build quality in up front to prevent unplanned work. Defining and approving standard changes to make change management flow more smoothly.

...having this simulation 7 years ago we probably would have made bigger steps in our journey.

- Jonathan Leckey, Head of Operations at AutoTrader

KNOWLEDGE AREAS

SIMULATION EXPERIENCE

'The IT manager stood and took control, "telling people" what we would do, 3 or 4 people tried asking questions or giving suggestions and were ignored. As a result I thought - OK, I'll stop giving input' explained one delegate, showing how poor collaboration, poor engagement and lack of 2-way communication prevents effective 'feedback loops' and 'continual learning' and showing how leadership styles need to change.

State of DevOps finding 2017 – By 2020, half of the CIO's who have not transformed their team's capabilities will be displaced... Leaders are the ones who set the tone of the organization and reinforce the desired cultural norms.

Source: https://puppet.com/resources/whitepaper/state-of-devops-report

BUSINESS VALUE OPTIMIZATION; BUSINESS ANALYSIS; SECURITY, RISK, COMPLIANCE

- BusDevOps not just DevOps Business managers are an integral part of the cross functional team, to ensure that the business realizes the commitment they need to make in terms of product management involvement to help ensure business value is achieved.
- Set the priorities and the 'why' up front make clearly visible at a stand-up to speed up decision making and create a shared sense of purpose.
- Focus on value creation and value leakage (including technical debt). The business must realize it's not just about building new features as fast as possible. Prioritization of resources must be balanced around value and outcomes versus costs and risks.
- Metrics that matter. Value realization is an important metric to validate the maturity of the business case, not just 'I am the business and I want this feature now!'

- Work is done when the business value is realized, not when the code is deployed.
- Priority mechanisms aligned to I-Governance needs. When there are
 no dedicated operations resources for multiple product teams there
 needs to be clear governance for resource prioritizations.

SIMULATION EXPERIENCE

The team started straight away with a stand-up meeting. 'Everybody needs to be here,' said the VP of Operations. 'Me too?!' asked the lead engineer, '...again I get taken away from my work!' – nobody explained WHY the lead engineer was invited and what the purpose was of the stand-up meeting. 'Can I get back and do some real work now?!' asked the engineer.

State of DevOps Finding 2016 – Lean product management: 'When employees see the connection between the work they do and its positive impact on customers, they identify more strongly with the company's purpose which leads to better IT and organizational performance.'

ABC of ICT: One of the GamingsWorks assessment instruments is the Attitude, Behavior, Culture card set. Results of workshops with more than 4000 organizations reveal that 'IT has too little understanding of business impact and priority' consistently scored number 1 worldwide.

Source: https://puppet.com/resources/whitepaper/2016-state-of-devops-report

TEST SPECIFICATION; PROGRAMMING

 Integrated, automated testing with test driven development: Testing engaged up front – not at the end – first we need to understand and adopt this end-to-end concept before we start rolling out a whole suite of automated tools. - **Testing to include ALL areas.** Testing for 'functional' (e.g. feature) and 'non-functional' (e.g. capacity, security). Testing is responsibility of all to ensure quality is built in up front and errors not passed downstream.

ARCHITECTURE & DESIGN; INFRASTRUCTURE ENGINEERING; CONTINUOUS DELIVERY

SIMULATION EXPERIENCE

The team was asked 'When is DevOps successful? What metrics can we use?

Answer: Faster time to market, failure rate of new releases, shortened lead time between fixes, faster mean time to recover. As CEO in the game I asked, 'What about Business Value metrics?' Team response: 'Which code feature was that?'

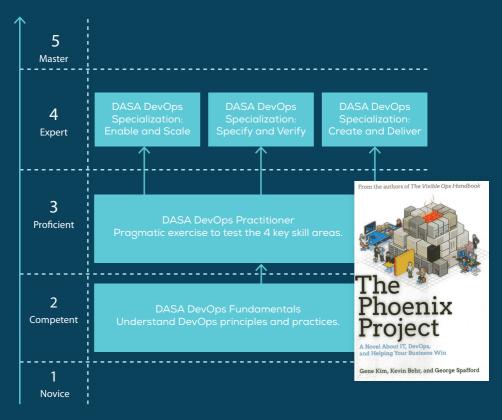
- **Creating Minimum Viable Products.** This requires re-architecting. Long-term commitment and effort.
- Creating standard changes. Automating changes as much as possible with integrated testing, exploring 'infrastructure as code' for faster changes.

As can be seen, the simulation exercise enabled people to test and experiment with DevOps practices and principles allowing them to see, feel and experience the benefits which helps overcome skepticism to adopting new ways of working. At the same time, teams were empowered to capture concrete, pragmatic actions to take away.

A key result for many organizations is the fact that teams have had their first experience and practice in performing a retrospective and applying continual learning and improvement. See the article on DevOps.com describing '5 Team Skills That Make DevOps a Success'.

Source: https://devops.com/5-team-skills-make-devops-success/

HOW THE DASA QUALIFICATION PROGRAM ALIGNS TO THE PHOENIX PROJECT SIMULATION



Doing the simulation after the training adds real value. After lots of theory, exercises and discussions, the real message and value of DevOps really sinks in during the simulation. Most valuable!

– DASA Fundamentals Participant

DASA DEVOPS FUNDAMENTALS

The DASA DevOps Fundamentals qualification is designed to provide the core education necessary to build your DevOps vocabulary and to understand its principles and practices. With the help of key DevOps concepts and terminology, real life case studies, examples and interactive group discussions and extensive exercises in each module you will acquire a fundamental understanding of DevOps.

The Business simulation, 'The Phoenix Project' can be added as an additional day of exercise and group discussions, providing an environment to see, feel and experience the principles and practices in action.

DASA DEVOPS PRACTITIONER

The DASA DevOps Practitioner course prepares candidates for the Practitioner qualification. It is designed to provide the core education necessary to put DevOps into practice. With the help of DevOps theory, pragmatic examples and exercises, and interactive group discussions, the course will help you understand how to apply the necessary skills to practice DevOps.

The Business simulation, 'The Phoenix Project' can be added as an additional day of pragmatic exercises and group discussions, providing an environment to test, explore and apply the key DevOps skills.



WHAT DO CUSTOMERS SAY ABOUT THE BENEFITS OF SIMULATIONS?

Results of a Survey we conducted into the benefits of business simulations revealed the following:

'Improved quality of service resulting from the change in behavior as agreed in the simulation game'. Which shows how a business simulation has a positive impact on Business Value Optimization. People are able to pragmatically apply 'continuous improvement'. At the end of the day they have a set of improvements they want to take away and apply, and understand how DevOps principles deliver Value.

'People started applying the behavior they had experienced in the simulation game'. Which shows how a business simulation helps support continuous improvement. This also demonstrates not only buy-in to the new ways of working, but also a commitment to execute.

'Reduces time, cost and effort to implement [best practices] as people have a better understanding of how to apply'. Which shows how a business simulation supports the DevOps third way 'continuous experimentation and learning', and can help reduce risks of a best practice improvement initiative from failing (70% still do not gain the hoped for value from a best practice training initiative), as well as speed up the adoption and value realization.

'People got together more after the simulation game to analyze and improve their work together'; Which shows how a business simulation helps foster a culture of continual improvement and supports and enables effective team building. It empowered teams and gave them the courage and self-confidence to take forward and apply their learning. ...it is interesting to experience how easy it is to succumb to SILO working, failing to effectively communicate, collaborate and make agreements, it was also powerful to see how significant performance improvement can be realized by applying simple DevOps principles and tools: visualization, prioritization with the customer, optimizing flow of work instead of optimizing resource utilization, cross functional teams etc.

- Frederik Schukken, Quint Wellington Redwood

APPENDIX

Alignment of the DASA competence model to the Simulation.

SKILLS & BEHAVIOR AREAS

COMPETENCE MODEL SIMULATION EXPERIENCE

Courage

Evangelism, coaching, self-confidence, proactivity, reflection, trust, open discussions, experimentation, fail fast, courage to change. The business simulation can be used as an instrument to evangelize within the organization.

In the simulation certain roles can practice and develop coaching skills.

The simulation is played in a number of rounds, this gives the teams self-confidence in their ability to reflect and improve and to give and receive feedback. Teams develop trust by working together, having open discussions and demonstrating commitment to agreed improvements.

In each round the team can experiment with their improvements and measure the impact.

The simulation rounds are 30 minutes allowing teams to fail fast, then make iterative improvements. Each time measuring the impact.

Courage to change: At the end of the simulation teams agree and commit to improvements they want to take away. Managers and teams can agree together to commit to these changes.

Team Building

Understanding the other's point of view, collaboration, mutual accountability, common purpose, ability to integrally support the service/product. In the simulation people can switch roles, e.g. Developers can play operational roles in the simulation to understand the other point of view, this is also achieved by having the endto-end team in the room to reflect together on failures and improvements.

The end-to-end team must collaborate in design, execution, reflection and improvement and at the end of the day to commit to end-to-end takeaways.

The team has mutual accountability for the results in the simulation and the required improvements. The team has mutual accountability for capturing end of day takeaway actions.

The team is given a set of strategic business goals that must be realized – giving a common purpose. These goals can be agreed in advance with delegates to match their own organizational situation. These are goals relating to both the new features and benefits realization, as well as technical debt and risk mitigation and reduction. At the end of day the team captures a common set of improvement actions that can then be related to their own strategic goals.

By having end-to-end representation in the simulation and at the end of day reflection the team learns to integrally support the product/service.

DevOps Leadership

Facilitating teams to higher performance, humility, transparency, service lifecycle mindset, stakeholder management. The simulation is played in a number of rounds. The game leader and/or the team coach can help facilitate the teams to higher performance, as well as facilitate the capture of improvement actions to take away at the end of the day.

Humility: Between simulation rounds the team has the chance to give and receive feedback in a safe environment on team and individual improvements.

The reflection and improvement items are recorded on flip chart and become a Visual Management System giving transparency on learning and improvement focused on achieving higher performance.

Service lifecycle mindset: In the simulation the team is confronted with strategy, design, execution, improvement and retirement of services, and confronted with a need to think about all stages when new products/ features are requested.

Stakeholder management: The simulation is played with end-to-end Business & IT stakeholders, at the end of the simulation each stakeholder provides input into takeaway actions and commits to these.

Continuous Improvement

Today we do our work better than yesterday, Kaizen mindset, quality at the source, first-time right, knowledge-sharing, ability to adapt. Between each simulation round the team is presented with KPI's that show their performance improvements as a result of applying DevOps skills, knowledge and behavior. At the end of day they capture continuous improvement actions to take away.

The team learns in the simulation to apply Visual Management Systems, Kanban and apply continual learning and improvement.

In the simulation the team learns about the 3 ways including never pass a defect downstream as well as feedback to build quality at the source. The team also learns the importance of integrated testing and having testing involved up front to ensure first time right.

In the simulation the team is confronted with constraints imposed by knowledge and skills, and learn to apply 3:1 - 1:3 T-shaped skills and multi-functional teams.

The team is confronted with failures, rework and unforeseen business situations which forces them to continually learn, at the same time testing their ability to adapt to changing demands and situations.

KNOWLEDGE AREAS

COMPETENCE MODEL SIMULATION EXPERIENCE

Business Value Optimization

Use of the IT service in real life, including direct feedback loop of user comments to team, service level management, definition of done, business activity/performance monitoring, business case management. In the simulation the team is confronted with direct user/business feedback after each round and improvement needs as well as rework and downtime generated by their decisions and improvements.

The team is given a set of business targets as well as conflicting SLA targets. They must learn to work together as business, development and operations to balance new features with technical debt to manage service level agreements. Each feature, project and issue is related to business value indicators such as revenue, costs, share value.

The team is confronted with the definition of done. Is work done when the feature is successfully deployed? Or when business value is realized? This will help validate and improve business case management. This is something they must agree on as an end-toend team of stakeholders.

In the simulation, the team must make business cases, based upon business activity and performance results from the previous round, for both improvements and when dealing with resource conflicts.

Business Analysis

Functional requirements, non-functional requirements, longer term development of business process (based on translation of market developments), data analysis, and refinement. In the simulation the team must learn to negotiate business needs, at the same time take into account technical debt, changing end-user needs, market demands and new delivery models such as infrastructure as code. The team is confronted with decisions on immediate gain vs longer term business investment at the expense of short term results.

Architecture & Design

Ensuring fit between developments and current situation, overall service design, patterns & styles. The team is confronted with the need to consider minimum viable product, infrastructure-as-code solutions as well as the need to remove or upgrade as a result of technical debt.

Infrastructure Engineering

Technical monitoring, performance management (e.g. load balancing etc.), capacity and availability management, reliability engineering, cloud, containerization. The team is confronted with the need to engage with all technical/operational groups to determine impact on existing and future infrastructures needs, upgrade old infrastructure to improve reliability and/or use cloud services.

Test Specification

Design of test cases, test concepts.

The team learns to apply integrated testing into the simulation and to delegate test responsibilities throughout the team.

Programming

Software engineering mastery, everything as code, data management. The concepts of infrastructure-as-code as well as programming-integrated testing are introduced in the simulation.

Continuous Delivery

Automated testing, deployment and release management, configuration management, version control, cloud, containerization, featuredriven delivery. The team learns the importance of understanding flow, identifying and eliminating waste, automating and standardizing changes and Integrating testing in the simulation as well as options for infrastructure-as-code to speed up flow and delivery related to specific business features.

Security, Risk, Compliance

Security, service continuity planning.

Security issues as well as Sarbanes Oxley compliance demands are introduced into the simulation. The team must also learn to understand the impact of all of the project's, features and issues on security and business continuity.

Instead of spending time discussing the scope and value of DevOps, this business simulation demonstrates that improving customer value and business outcomes is above all a matter of attitude and behavior of all people working within the system.

- Dominique van de Boom, Lean IT Association

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