DevOps Architecture Best Practices

The exploration of roads
to give direction to a
DevOps service organisation

Bart de Best

Edited by
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Colophon

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Alice's Adventures in Wonderland

Alice: …Would you tell me, please, which way I ought to go from here?'
'That depends a good deal on where you want to get to,' said the Cat.
'I don't care where –' said Alice.
'Then is doesn't matter which way you go,' said the Cat.
'- so long as I get somewhere,' Alice added as an explanation.
'Oh, you're sure to do that,' said the Cat, 'if you only walk long enough.'

by Lewis Carroll
1832 - 1898
online-literature.com

Table of Contents

1 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 TARGET AUDIENCE 1
1.3 STRUCTURE 2
1.4 APPENDICES 2
1.5 READING GUIDELINE 2
1.5.1 PRINCIPLES 2
1.5.2 TIPS 3
2 CASE COMPANY 5
2.1 THE ORGANISATION 5
2.2 THE VISION 5
2.3 THE GOAL 5
2.4 THE STRATEGY 5
2.5 THE IST SITUATION 5
2.6 THE SOLL SITUATION 6
2.7 THE MIGRATION PATH 6
3 DEVOPS ORGANISATION 7
3.1 INTRODUCTION 7
3.2 ORGANISATION DESIGN 7
3.2.1 ORGANISATION-ARCHETYPES 7
3.2.2 KOTTER CHANGE STRATEGY 9
3.2.3 QUADRANT MODEL FOR THE CHANGE STRATEGY 11
3.2.4 ORGANISATIONAL SCALING 12
3.3 ORGANIZATIONAL MANAGEMENT 13
3.3.1 SELF-MANAGEMENT 13
3.3.2 UNCERTAINTY REDUCTION 16
3.4 HUMAN RESOURCE MANAGEMENT 17
3.4.1 MATURITY MATRIX 17
4 DEVOPS DEVELOPMENT 19
4.1 AGILE DEVELOPMENT PROCESS 19
4.1.1 VALUE STREAM MAPPING 19
4.1.2 TASK MODEL 21
4.1.3 SEGREGATION OF DUTIES 23
4.2 AGILE DESIGNING 24
4.2.1 SERVICE ORIENTATION 24
4.2.2 BUILDING BLOCKS 25
4.2.3 SPLITTING 26
4.2.4 REQUIREMENT BASED PROCESS DESIGN 27
4.3 AGILE BUILDING BLOCKS 28
4.3.1 CONTINUOUS INTEGRATION 28
4.4 AGILE TESTING 29
4.4.1 FAST FEEDBACK 29
4.4.2 TEST DRIVEN DEVELOPMENT 30
4.4.3 BEHAVIOR DRIVEN DEVELOPMENT 30
5 DEVOPS OPERATIONS 33
5.1 AGILE SERVICE MANAGEMENT PROCESSES 33

5.1.1 DevOps requires process control 33
5.1.2 Process control 34
5.1.3 DevOps control model 35
5.1.4 Process goals 37
5.1.5 Process KPI's 38
5.1.6 Self-management and self-organisation 38
5.1.7 Integration of ITIL and Agile development 39
5.1.8 Integration of ISO 20000 and Agile development 41
5.2 Release & Deployment 41
5.2.1 Continuous Delivery 41
5.2.2 Forward releasing 42
5.2.3 Pipeline 44
5.3 Monitoring 45
5.4 Tooling 46

6 DEV AND OPS INTEGRATION 49
6.1 Splitting 49
6.2 Cooperation 50

7 DEVOPS MATURITY 53
7.1 Maturity models 53
7.1.1 Self-development 53
7.1.2 Ordering 53
7.1.3 Model selection 54
7.1.4 Zero measurement 54
7.1.5 Control 54

8 DEVOPS CUBE MODEL 57
8.1 What is the DevOps Cube? 57
8.2 Side 1 - Flow 59
8.3 Side 2 – Feedback 60
8.4 Side 3 – Continual learning and experimenting 61
8.5 Side 4 – Governance 62
8.6 Side 5 – E2E deployment pipeline 63
8.7 Side 6 – Quality Assurance 64

9 DEVOPS CE-MODEL 67
9.1 What is the CE-model? 67
9.2 Maturity dimensions 69
9.3 DevOps CE-model, Continuous Integration 70
9.4 DevOps CE-model, Continuous Delivery 72
9.5 DevOps CE-model, Continuous Testing 75
9.6 DevOps CE-model, Continuous Monitoring 79
9.7 DevOps CE-model, Continuous dOcumentation 82
9.8 DevOps CE-model, Continuous Learning 85
9.9 Overview per aspect area 87

10 DEVOPS IN PRACTICE 91
10.1 Change paradigm 91
10.2 Agile design 92
10.2.1 The questions 93
10.2.2 FSA Vision 93
10.2.3 FSA power 95

10.2.4 FSA ORGANISATION 95
10.2.5 FSA RESOURCES 97

APPENDIX A, LITERATURE LIST 101

APPENDIX B, GLOSSARY 103

APPENDIX C, ABBREVIATIONS 119

APPENDIX D, DEVOPS TOOLS 123

APPENDIX E, WEBSITES 127

APPENDIX F, INDEX 129

Figures

Figure 3-1, Quadrant model for the change strategy. ... 12
Figure 4-1, Value Stream Mapping. ... 20
Figure 4-2, Application architecture. ... 22
Figure 4-3, Tasks depicted on the application architecture. ... 22
Figure 4-4, Task distribution. ... 23
Figure 4-5, Example of a building block picture for an information service. ... 26
Figure 4-6, Relationship between requirements and designs. ... 28
Figure 5-1, Process roles and Agile Scrum roles. ... 34
Figure 5-2, Software development process. ... 37
Figure 5-3, Train metaphor. ... 43
Figure 5-4, The train metaphor in use. ... 43
Figure 8-1, Necker cube. ... 57
Figure 8-2, Front side DevOps Cube. ... 58
Figure 8-3, Back side DevOps Cube. ... 58
Figure 9-1, DevOps CE-Spider model. ... 69
Figure 9-2, DevOps CI-Spider model. ... 72
Figure 9-3, DevOps CD-Spider model. ... 75
Figure 9-4, DevOps CT-Spider model. ... 79
Figure 9-5, DevOps CM-Spider model. ... 82
Figure 9-6, DevOps CO-Spider model. ... 84
Figure 9-7, DevOps CL-Spider model. ... 87
Figure 10-1, Change paradigm. ... 91
Figure 10-2, Change paradigm for an FSA at Assuritas. ... 93
Figure 10-3, FSA Vision at Assuritas. ... 94
Figure 10-4, Ideal design pyramid. ... 94
Figure 10-5, FSA Power at Assuritas. ... 95
Figure 10-6, FSA Organisation at Assuritas. ... 96
Figure 10-7, Implementation Agile design at Assuritas. ... 96
Figure 10-8, FSA Template. ... 97
Figure 10-9, FSA Usage in the development process. ... 97
Figure 10-10, FSA Resources. ... 98

Tables

Table 1-1, Appendices. ... 2
Table 1-2, Format of a principle. ... 3
Table 3-1, PR-ORG-001. Organisation archetypes. ... 7
Table 3-2, Three organisation archetypes. ... 9
Table 3-3, PR-ORG-002. Top-down orchestration. ... 9
Table 3-4, PR-ORG-003. Top-down orchestration. ... 11
Table 3-5, Square model. ... 12
Table 3-6, PR-ORG-004. Organisational scaling. ... 13
Table 3-7, PR-ORG-005. Self-management. ... 14
Table 3-8, Organisation types from Mintzberg. ... 14
Table 3-9, Relationship between organisational types and coordination mechanisms. ... 15
Table 3-10, Relationship between organisational types and coordination mechanisms ... 15
Table 3-11, PR-ORG-006. Uncertainty reduction. ... 16
Table 3-12, PR-ORG-007. Continuous learning. ... 17

Table 3-13, PR-ORG-008. Maturity matrix. 18
Table 4-1, PR-PRO-001. Chains. 20
Table 4-2, PR-PRO-002. Value Stream Mapping. 20
Table 4-3, PR-PRO-003. Patterns. 21
Table 4-4, PR-PRO-004. Four eyes principle. 23
Table 4-5, PR-PRO-005. Service architecture. 24
Table 4-6, PR-PRO-006. Traceability. 24
Table 4-7, PR-PRO-007. Building blocks. 25
Table 4-8, PR-ORG-009. Team layout. 26
Table 4-9, PR-PRO-008. Requirements. 27
Table 4-10, PR-SCI-001. Traceability. 29
Table 4-11, PR-CT-001. Fast feedback. 29
Table 4-12, PR-CT-002. Ideal test pyramid. 30
Table 4-13, PR-CT-003. Test Driven Development. 30
Table 4-14, PR-CT-004. Behavior Driven Development. 31
Table 5-1, PR-PRO-009. Control of service management. 33
Table 5-2, PR-PRO-010. SLA norms in the corporate section of the DoD. 34
Table 5-3, PR-PRO-011. Filling in the nine-plane model of Maes. 35
Table 5-4, The control of DevOps. 36
Table 5-5, PR-PRO-012. Process goals. 37
Table 5-6, PR-PRO-013. Lean performance indicators. 38
Table 5-7, PR-PRO-014. Self-management and self-organisation. 39
Table 5-8, PR-PRO-015. Restriction of self-management and self-organisation. 39
Table 5-9, PR-PRO-016. Single Point of Contact. 40
Table 5-10, PR-PRO-017. Timebox. 40
Table 5-11, PR-PRO-018. Timebox. 40
Table 5-12, PR-PRO-019. Backlog. 40
Table 5-13, PR-PRO-020. Backlog. 41
Table 5-14, PR-PRO-021. Integration support processes. 41
Table 5-15, PR-PRO-022. ISO 20000 processes. 41
Table 5-16, PR-PRO-023. ISO 20000 processes. 41
Table 5-17, PR-PRO-024. Fail fast. 42
Table 5-18, PR-PRO-025. Meta-data. 42
Table 5-19, PR-PRO-026. Traceability. 44
Table 5-20, PR-PRO-027. Versioning. 44
Table 5-21, PR-PRO-028. Everything as code. 44
Table 5-22, PR-PRO-029. Continuous monitoring. 45
Table 5-23, PR-PRO-030. Tap open. 45
Table 5-24, PR-PRO-031. Failure mode. 45
Table 5-25, PR-TLS-001. Global tooling architecture. 46
Table 5-26, PR-TLS-002. Tool integration. 46
Table 5-27, PR-TLS-003. Generation above specification. 47
Table 6-1, Indication of the Dev and Ops roles. 49
Table 6-2, PR-OPS-001. OPS-traceability. 50
Table 6-3, PR-OPS-002. OPS-partnerships. 51
Table 7-1, PR-MAT-001. Maturity model as a development tool. 53
Table 7-2, PR-MAT-002. Ordering. 54
Table 7-3, PR-MAT-003. Model selection. 54
Table 7-4, PR-MAT-004. Improvements only take place after a baseline measurement. 54
Table 7-5, PR-MAT-005. Consider improvements as technical debt. 55
Table 7-6, PR-MAT-006. Manage the change. 55

Table 8-1, Side 1 questions. 60
Table 8-2, Side 2 questions. 61
Table 8-3, Side 3 questions. 62
Table 8-4, Side 4 questions. 63
Table 8-5, Side 5 questions. 64
Table 8-6, Side 6 questions. 65
Table 9-1, DevOps CE-model. 67
Table 9-2, Continuous Everything. 68
Table 9-3, CMMI levels for Continuous Everything. 69
Table 9-4, PR-ORG-009. Maturity levels. 70
Table 9-5, CI maturity characteristics. 72
Table 9-6, CD maturity characteristics. 75
Table 9-7, CT maturity characteristics. 78
Table 9-8, CM maturity characteristics. 81
Table 9-9, CO maturity characteristics. 84
Table 9-10, CL maturity characteristics. 87
Table 9-11, Topics in the 'Methodology' aspect. 88
Table 9-12, Topics in the 'Control Mechanism / Tools' aspect. 88
Table 9-13, Topics in the 'Management' aspect. 89
Table 9-14, Topics in the 'Data' aspect. 89
Table 9-15, Topics in the 'Quality' aspect. 90
Table 9-16, Topics in the 'Strategy' aspect. 90

Appendices

Appendix A, Literature list 101
Appendix B, Glossary 103
Appendix C, Abbreviations 119
Appendix D, DevOps tools 123
Appendix E, Websites 127
Appendix F, Index 129

Preface

This book has been compiled based on my experiences in the Development & Operations (DevOps) work area. It is a snapshot of the best practices that I now use. Given the speed with which the world of DevOps is developing and the need to give you as many images of DevOps architecture as possible with as little text as possible, I have decided to keep this book Agile. This means that it describes very briefly what important insights I have gained during my role as a consultant, trainer, coach and examiner with regard to DevOps related work. Where applicable, I refer to sources that I have consulted myself to further qualify.

I have already shared many of my experiences in the articles on www.ITpedia.nl. I have also translated the knowledge and skills into various training courses that I provide. These can be found at www.dbmetrics.nl.

Hereby I thank the following people for their inspiring contribution to this book and the great cooperation!

- J.A.E. (Jane) ten Have — APG AM
- Dr. L.J.G.T. (Louis) van Hemmen — BitAll B.V.
- F.J. (Fred) Ros RE RA — Auditdienst Rijk
- Ir. F. (Franklin) Selgert — AnyWi
- E. (Esther) Terpstra — HensOn
- D (Dennis) Wit — ING

I hope you enjoy reading this book and especially good luck in applying DevOps architecture within your own organisation.

If you have any questions or comments, please do not hesitate to contact me. A great deal of time has been spent on making this book as complete and consistent as possible. If you do find shortcomings, I would appreciate it if you let me know, then these items can be processed in the next edition.

1 Introduction

Message:
This chapter describes the background of the book (1.1), the intended target group (1.2), the structure (1.3) and finally some tips for reading this book (1.4).

1.1 Background

This book was written on the basis of my experiences in the field of DevOps as a consultant, coach, trainer and examiner. From my background as a service management architect, the developments that take place within DevOps worldwide are very interesting to observe. The worlds of development and management that have always been at odds with each other are now being integrated and working closely together. But the gap between business and Information Technology (IT) is also closed by a much closer involvement of the business in change. In fact, with the arrival of business DevOps, the worlds of IT and business are being merged into one system.

Even more important is to determine whether a guiding force is still needed for the design and operation of the DevOps teams in service organisations. After all, it is assumed that teams are self-organising and self-managing. My experience is that people think and write about this very differently. Two extremes can be observed. On one side of the spectrum, the position is taken that architecture only develops (emerging architecture) and is not drawn up in advance. On the other side of the spectrum, it is stated that there must be an Agile architecture to be able to develop the information systems within it. In this book I start from the fact that the entire spectrum of direction is justified and desirable from a certain context.

If there is a simple system that is loosely coupled (little to no interfaces with other systems and teams) and that is very dynamic such as Business Intelligence (BI) solutions, then an emerging architecture can be used. With such Systems of Information (SoI) there is, after all, less need for the framework of architecture. This also applies to apps, websites or cloud services that are not directly linked to a back office. These are the so-called System of Engagement (SoE) systems. These SoI and SoE information systems are usually used in the front office organisation.

The situation is different with the information systems of the back-office organisation. These are, for example, the financial systems that are subject to the strict monitoring of accountants who must audit and sign the annual accounts and of the government such as the tax authorities. But also, for the logistical information systems and the Enterprise Resource Planning (ERP) systems, high quality requirements apply and the need for risk management is much greater. With these System of Records (SoR) it is much more common to use architecture as a direction.

The world of DevOps is very dynamic. What works well today can be better tomorrow. In this book I present the DevOps architecture best practices that I currently apply to organisations. I realize that these best practices will not apply to all information systems and that the approach is a snapshot that may be outdated by the increasing speed of innovation.

1.2 Target audience

The target audience of this book are all functions involved with the DevOps teams. This includes architects, Dev engineers, Ops engineers, Product owners, Scrum masters, Agile Coaches and representatives of the user organisation. This book is of course also very suitable for line managers, process owners, process managers, et cetera, who are involved in the realisation of the information provision by means of a DevOps method.

Finally, there is a target audience that does not develop or manage but that determines whether the information provision meets the required criteria. This target audience includes quality employees and auditors. They can use this book to identify risks that need to be taken or controlled.

1.3 Structure

This book highlights the architecture from three perspectives:

- Architecture of the DevOps organisation
- Architecture of the DevOps development
- Architecture of the DevOps operations

A case is used to explain these perspectives. This case is described in the following chapter. In the three chapters with the three perspectives (chapters 3, 4 and 5) examples are given that are based on the case. Chapter 6 deals with the integration of the Dev role and the Ops role. Chapter 7 indicates how to get a grip on the maturing of the DevOps craftsmanship. For this purpose, chapters 8 and 9 offer two assessment models to determine the maturity. This book then concludes with an example implementation of Agile design based on the case model.

1.4 Appendices

The appendices contain important information that helps to better understand DevOps architecture.

Appendices	Subject	Policies, principles and models
A	Literature list	This book refers to consulted literature in the form of: [Author Year]. The full name of the author, the title and the ISBN number are given in the appendix.
B	Glossary	Only the most important concepts are explained in this appendix.
C	Abbreviations	Many abbreviations are used in the world of DevOps. Frequently used terms have been abbreviated for the readability of this book. The first time an abbreviation is used, it is written in full.
D	DevOps tools	Tools are inextricably linked to DevOps. This appendix provides an overview of the commonly used tools mentioned.
E	Websites	A number of relevant websites are included in this appendix. This book refers to this appendix by the reference: [http Name].
F	Index	The index includes the reference of terms used in this book.

Table 1-1, Appendices.

1.5 Reading Guideline

This reading guide explains the manner in which the principles are defined in this book. Then some tips are given about abbreviations and references.

1.5.1 Principles

The deliverables of architects are architecture principles and architecture models. In this book, architecture principles are defined based on the DevOps aspects discussed. The format of this is shown in Table 1-2.

P#	PR - <attribute> - <serial number> The attribute is a mnemonic of a concept. This ensures a clustering of principles with its own serial number. For example, the 'organisation' uses the mnemonic 'ORG'. Dividing clusters makes it easier to keep the numbering unique. It also shows the coherence between principles. The meaning of mnemonics is not explained further because it is not interesting. Every organisation has its own identification of principles and can freely adopt these principles defined in this book and give it its own identification.
Principle	A one-liner that defines the principle.

Rationale	The rationale explains why it is important that the principle is followed. A principle without importance is meaningless, it must serve a purpose.
Implication	The implication indicates the consequences of applying the principle. A principle without implication is meaningless. It must have an intended effect.

Table 1-2, Format of a principle.

1.5.2 Tips

In this book it is assumed that the reader knows the basic concepts of DevOps. For convenience, the most important DevOps terms are defined in Appendix B. Two books that can be used to gain more basic knowledge are [Best 2017c] and [Kim 2016].

The number of abbreviations is limited in this book. However, terms that always come back are shown as abbreviations to improve readability. Appendix C shows these abbreviations.

In case Business Information Services Library (BiSL), Application Services Library (ASL) or Information Technology Infrastructure Library (ITIL) are mentioned, then the latest version of these models is referred to, unless another version is indicated.

A shortened name is often used for tools. The full name of these tools can be found in Appendix D. The references to publications on the internet are represented as [http Name].

Interesting URLs are included in Appendix E.

Epilogue

My experience is that the ideas that I capture in an article or a book keep evolving. In case you are going to work on a specific topic from this book in your own DevOps organisation, I advise you to contact me. There may be additional articles or experiences in this area that I can share with you. This also applies inversely. If you have certain experiences that complement what is described in this book, I invite you to share this with me. You can reach me via my e-mail address bartb@dbmetrics.nl.

About the author

Drs. Ing. B. de Best RI. has been active in ICT since 1985. He worked primarily with the top 100 of Dutch business and government organisations. He has acquired experience in different roles within all aspects of system development, including operations for 12 years. After that, he focused on the subject of service management.

Currently, as a consultant, he is active in all aspects of the knowledge management cycle of service management, such as training ICT managers and service managers, advising service management organisations, improving service management processes and outsourcing (parts of) service management organisations. He graduated at both the HTS and University level in the management field.

Other books by this author

Cloud SLA
The best practices of cloud service level agreements

More and more organisations choose to replace traditional ICT services by cloud services. Setting up effective SLAs for traditional ICT services is a real challenge for many organisations. With the arrival of cloud services, this seems to be much simpler at first, but soon the hard questions come up like data ownership, information links and security. This book describes what cloud services are. The risks involved in entering into contracts and SLAs are discussed. Based on a long list of risks and countermeasures, this book also provides recommendations for the design and content of the various service level management documents for cloud services. This book first defines cloud and then describes various aspects like cloud patterns and the role of a cloud broker. The core of the book is the discussion of contract aspects, service documents, service design, risks, SLAs and cloud governance. In order to allow readers to get started with Cloud SLAs, the book also includes checklists of the following documents: Underpinning Contract (UC), Service Level Agreement (SLA), Document Financial Agreements (DFA), Document Agreement and Procedures (DAP), External Spec Sheets (ESS) and Internal Spec Sheets (ISS).

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ISBN (NL) : 978 90 71501 739

SLA Templates
A complete set of SLA templates

The most important thing in providing a service Is that the customer is satisfied with the delivered performance. With this satisfaction, the supplier gets re-purchasing's, promotions in the market and is the continuity of the company ensured. Perhaps the most important aspect of this customer satisfaction for a supplier is that the employees in question get a drive to further develop their own knowledge and skills to satisfy even more customers. This book describes the templates for Service Level Agreements in order to agree with the customer on the required service levels. This book gives both a template and an explanation for this template for all common service level management documents.

The following templates are included in this book:

- Service Level Agreement (SLA)
- Underpinning Contract (UC)
- Operational Level Agreement (OLA)
- Document Agreement and Procedures (DAP)
- Document Financial Agreements (DFA)
- Service Catalogue
- External Spec Sheet (ESS)
- Internal Spec Sheet (ISS)
- Service Quality Plan (SQP)
- Service Improvement Program (SQP)

Author : Bart de Best
Publisher : Leonon Media, 2017
ISBN (UK) : 978 94 92618 030
ISBN (Pocket Guide) : 978 94 92618 320

Agile Service Management with Scrum

On the way to a healthy balance between the dynamics of developing and the stability of managing the information provision

Using Agile software development is taking off. The terms Scrum and Kanban are already common to many organisations. Agile software development needs different requirements for the management of software. Many organisations are mastering this new challenge. In particular, the interaction between the Scrum development process and the support of the software that the Scrum development process has produced, is an important aspect. This book specifically discusses this interaction. Examples of topics that are discussed here are the service portfolio, SLAs and the handling of incident and change requests.

This book first defines the risk areas when implementing Scrum and Kanban. Next the various Agile terms and concepts are discussed. The content of Agile service management is described both at the organisational- as the process level. The relevant risks are specified for each of the service management processes. In addition, the implementation of each process within the context of Scrum is indicated.

Auteur : Bart de Best
Uitgever : Leonon Media, 2015
ISBN (NL) : 978 90 7150 1807
ISBN (UK) : 978 94 9261 8085

Agile Service Management with Scrum Researched

On the way to a healthy balance between the dynamics of developing and the stability of managing the information provisions

Many companies are starting to apply Agile software development using Scrum or Kanban or have already implemented the new development process. Sooner or later the question arises how this development process relates to the service management processes. The book 'Agile Service Management with Scrum' has already addressed this interface and a number of risks per service management process have been identified. Countermeasures that can be taken are also defined. In a research at ten organisations these risks were presented, and they were asked how they deal with these risks. The research included the investigation into which Agile aspects are applied and in particular those of Scrum or Kanban. Finally, each organisation has carried out a maturity assessment for both the Agile development process and the change management process.

This book is the report about the research of the collaboration of Agile software development and service management processes in practice. The target group of this book includes all parties involved in the application of Agile software development and who would like to know how colleagues have shaped this crucial interface for successful service provision. In this book a short description is given of each organisation about how the Agile development process has been designed.

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Uitgever : Leonon Media, 2015
ISBN (NL) : 978 90 7150 1845
ISBN (UK) : 978 94 9261 8177

DevOps Best Practices

Best Practices for DevOps

In recent years, many organisations have experienced the benefits of using Agile approaches such as Scrum and Kanban. The software is delivered faster whilst quality increases and costs decrease. The fact that many organisations that applied the Agile approach did not take into account the traditional service management techniques, in terms of information management, application management and infrastructure management, is a major disadvantage. The solution to this problem has been found in the Dev (Development) Ops (Operations) approach. Both worlds are merged into one team, thus sharing the knowledge and skills. This book is about sharing knowledge on how DevOps teams work together.

For each aspect of the DevOps process best practices are given in 30 separate articles. The covered aspects are: Plan, Code, Build, Test, Release, Deploy, Operate and Monitor. Each article starts with the definition of the specifically used terms and one or more concepts. The body of each article is kept simple, short and easy to read.

Author	: Bart de Best
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ISBN (Pocket Guide)	: 978 94 92618 306

DevOps Assessments

A handy tool for DevOps teams to improve their skills

DevOps teams organise themselves and improve the Development (Dev) and Operations (Ops) aspects that are still underexposed. On the other hand, DevOps teams share knowledge and skills with other DevOps teams so that they reinforce each other.

This book provides a tool to make the DevOps teams aware of where they stand in terms of maturity and the next steps they can take to develop. To this end, this book offers two assessments. The first assessment is the DevOps Cube assessment based on 'The Three Ways' by Gene Kim. The second assessment is based on Continuous Everything whereby all aspects of DevOps are measured using the CMMI model.

The DevOps Cube assessment is based on the idea that DevOps can be viewed from six different perspectives. Each gives a specific picture of the design of the DevOps philosophy. The fronts of the cube are based on 'The Three Ways': 'Flow', 'Feedback' and 'Continuous learning', the back of the cube include: 'Governance', 'Pipeline' and 'QA'.

The Continuous Everything assessment comprises six list of questions that make the DevOps maturity measurable on five levels. The following dimensions are included: 'Continuous Integration', 'Continuous Delivery', 'Continuous Testing', 'Continuous Monitoring', 'Continuous Documentation', and 'Continuous Learning'. This assessment book is an excellent mirror for every DevOps team that wants to quickly obtain a complete picture of the DevOps best practices to be addressed.

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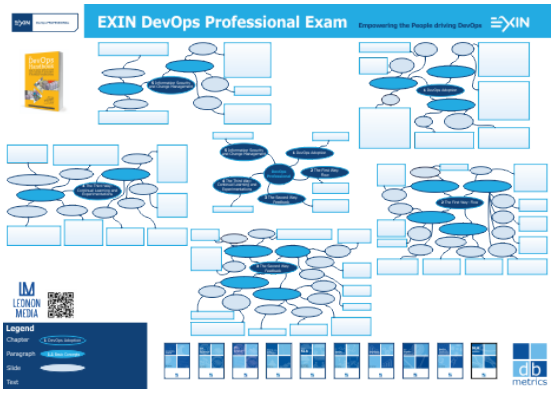

Author : Bart de Best
Publisher : Leonon Media, 2018
Ordering : info@leonon.nl

DevOps Poster

DevOps Professional Exam Poster

This poster lists all the DevOps terms that a student must learn in order to pass the exam of DevOps Professional of Exin. This poster can be ordered at info@leonon.nl.

The subjects on the poster are based on the basic training material of Exin. Since there are many terms to be learned, this poster will help to learn them by reviewing them all at once daily.