

Data Management SPICE

Because Data Needs a Little Seasoning

Working Group Data Management SPICE @ intacs.info

max. 45 Minutes



<https://chatgpt.com/g-g-2fkFE8rbu-dall-e>

Working Group Data Management SPICE

Working Group Lead



Thomas Sievers

Lead of Working Group Data Management SPICE

Member of the Advisory Board

thomas.sievers@intacs.info

“Bring knowledge and awareness for data to the people.”



Christian Hübscher

Co-Lead of Working Group Data Management SPICE

christian.huebscher@intacs.info

“Drive the future development of next generation DMS”

Working Group Members

Andreas Gasch

Dr. Martin Jung

Heiko Zastrau

Imane el Hamydy

Martin Hueppauff

Michael Neher

Mohamed el Gharbawy

Dr. Niko Pollner

Nina Aures

Dr. Reiner Seitz

Rüdiger Beilharz

Samer Sameh

Stefan Feser



After login to Intacs® webpage!



Ensuring ASPICE Guidance Reflects Today's Realities?

- Experiential Learning & Tacit Knowledge
- Dynamic Capabilities in Data Engineering
- “Fit for Purpose” Process Selection
- Recency of Practice
- Alignment of Theory & Modern Practice



Foto: Dmitry Ratushny / Unsplash

“Trust the Data”, they said ... or when just good, is not enough



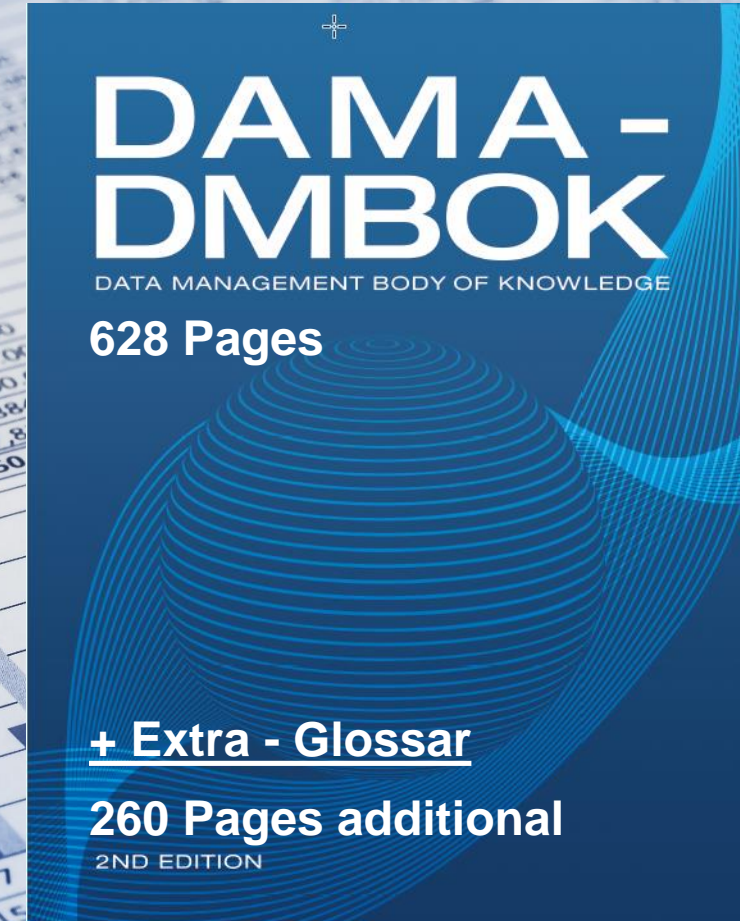
Trying a definition of data management

Data Management is the

- set of all methodological, conceptual, organizational, technical measures and procedures
- for handling the resource "data",
- with the aim of introducing them into business processes
- with their maximum potential for use.¹

Data Management is

- the development, execution, and supervision
- of plans, policies, programs, and practices
- that deliver, control, protect, and enhance the value of data and information assets
- throughout their lifecycles.²



¹ Based on Wikipedia: <https://de.wikipedia.org/wiki/Datenmanagement>

² DAMA DMBOK 2nd Edition 2017 (Data Management Body of Knowledge)

Agenda

Why Data is **NO** Software

While data and software are both essential components in modern digital systems, they are fundamentally different in their nature, function, lifecycle, and usage.

Data provides the raw materials; software is the structured mechanism that processes and transforms data into meaningful outputs.



8 intacs™ Data Management SPICE Introduction | © 2025, Version 1.0

intacs.info

Motivation

In the dynamic world of data management, achieving high quality isn't just about data accuracy and completeness - it's about creating systems that consistently deliver reliable insights and support strategic decisions.

The belief that more data always equates to better quality, or that a perfect data quality standard is universally attainable - can lead organizations down paths that overlook practical, contextual approaches to quality.



15 intacs™ Data Management SPICE Introduction | © 2025, Version 1.0

intacs.info

Getting Started with Data Management

Data management is the systematic process of collecting, storing, organizing, and maintaining data to ensure its accuracy, accessibility, and security.



24 intacs™ Data Management SPICE Introduction | © 2025, Version 1.0

intacs.info

Fundamentals of Data Management

It encompasses a broad range of activities designed to optimize the use of data within an organization, ensuring that it is available for decision - making, analysis, and operational needs.



30 intacs™ Data Management SPICE Introduction | © 2025, Version 1.0

intacs.info

Guideline to Data Management SPICE

The Data Management SPICE PAM is designed to provide organizations with a framework for assessing and improving their data management processes.

Drawing inspiration from the well - established Automotive SPICE® (ASPICE®) model, this adapts the principles of process capability and maturity assessment specifically for data management, ensuring alignment with the highest standards of efficiency, security, and quality.



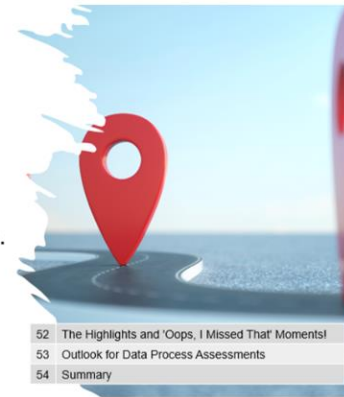
36 intacs™ Data Management SPICE Introduction | © 2025, Version 1.0

intacs.info

Conclusion

Data management serves as the foundation of modern organizations, driving informed decision - making, operational efficiency, and long - term success.

By understanding the principles and processes of data management, organizations can transform raw information into valuable assets, enabling smarter business strategies and enhanced performance.



52 The Highlights and 'Oops, I Missed That' Moments!
53 Outlook for Data Process Assessments
54 Summary

51 intacs™ Data Management SPICE Introduction | © 2025, Version 1.0

intacs.info

Why Data is **NO** Software

While data and software are both essential components in modern digital systems, they are fundamentally different in their nature, function, lifecycle, and usage.

Data provides the raw materials; software is the structured mechanism that processes and transforms data into meaningful outputs.



Data is not the same as Software

It brings different challenges, such as governance and lifecycle management, which are not fully addressed by Software – focused models.

Therefore, adaptations are necessary – in assessors' mindset, also in how the framework is presented and explained.

It's a Breakthrough, a Disaster, and Just a Phase

Assessors consider Data Management SPICE an important topic, but they lack sufficient background to conduct trainings or lead an assessments.

Assessors said that the topic can be assessed using the existing ASPICE® model and that there is no need for a new model, as many have been developed in an increasingly inflationary manner.

Assessors are calling for a compatible and understandable model that is adapted to the mindset of an assessor trained in Software.

Foto: Dmitry Ratushny / Unsplash

Nature

Data is raw, unprocessed, and context dependent. It represents facts or observations about the world but carries no inherent meaning until interpreted. Data can exist in various forms such as numbers, text, images, or sensor readings.

Software consists of structured instructions (code) written in programming languages that tell a machine what tasks to perform. It is active, logical, and purpose-driven, enabling systems to process data, interact with users, and perform specific functions.



Function

Data serves as the input that fuels analysis, decision-making, and system operations. It needs to be processed or analyzed to extract value or derive meaning.

Software is the mechanism that processes, manipulates, and transforms data to produce results, manage tasks, or create user interfaces. It enables the execution of logic and algorithms to solve problems or automate processes.



Motivation

In the dynamic world of data management, achieving high quality isn't just about data accuracy and completeness - it's about creating systems that consistently deliver reliable insights and support strategic decisions.

The belief that more data always equates to better quality, or that a perfect data quality standard is universally attainable - can lead organizations down paths that overlook practical, contextual approaches to quality.



Another Day, Another
Process to Ignore?

Processes don't do
work, people do.

- The Human Element
- Blame the Process
- Checklists Don't Think
- Process Overload
- Culture Eats Process for Breakfast

John Seely Brown

Data Management SPICE

Lovingly crafted by data
people, for data people

Because who else could
truly appreciate another
framework with this many
acronyms?

quote fancy

Intentions and Feelings

Good intentions by data people

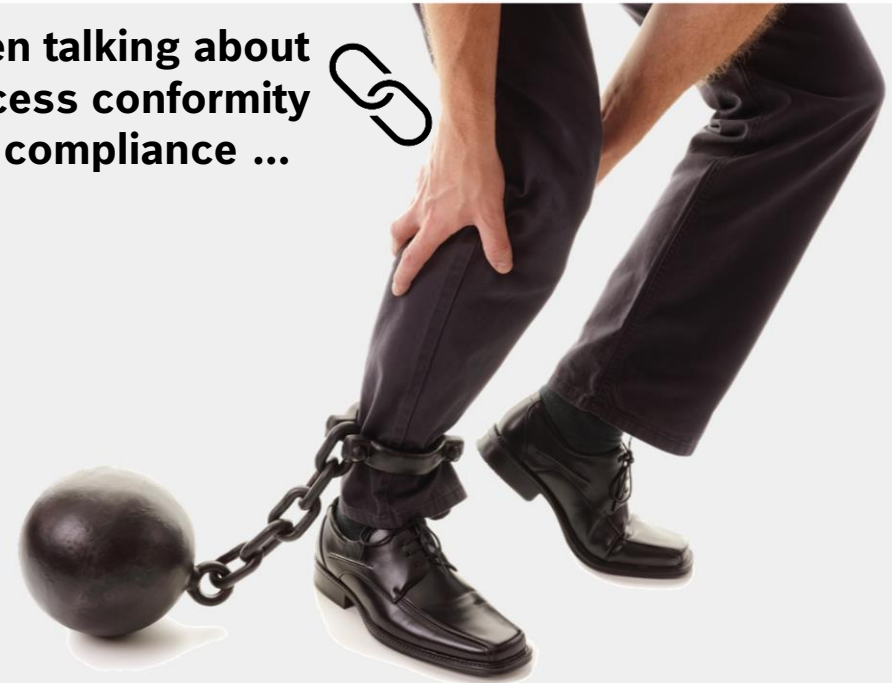


e.g., Data Executives, Data Owners,
Governance Managers,
Data Stewards and many more.



... hampered by the feeling of just more ...

When talking about
process conformity
and compliance ...



Did we lose the focus?

Following the Rules or Achieving Excellence?

The ASPICE Compliance Dilemma

Convictional usage in ASPICE

We're all in on ASPICE. It's not just a process; it's the best way to build the future of mobility. We've seen the results firsthand and we're confident it's the way to go.

ASPICE®

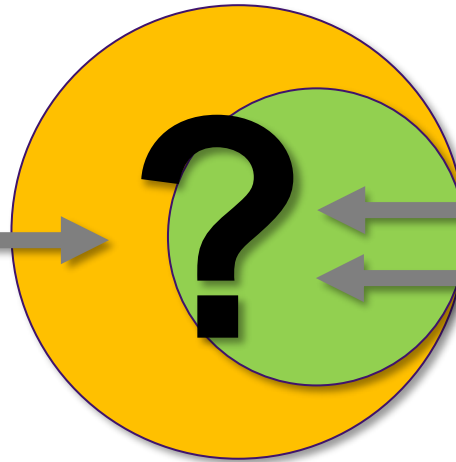
Convictional usage

Due deeply convincement, that is beneficial

Product quality is about what you make

Process quality is about how you make it

Product



Quality

All on the same maturity level

Conformity in ASPICE

Refers to the alignment of processes with the ASPICE model's defined requirements and guidelines, ensuring that practices follow the expected process framework.

ASPICE®

Conformity

Due customer requirement

ASPICE®

Compliance

Due e.g. legal requirements (state of the art)

Compliance in ASPICE

On the other hand, indicates adherence to contractual or regulatory obligations, which may include ASPICE requirements but also consider additional legal or customer-specific demands.

Myths and Misunderstandings in Data Management Quality

Data Quality is Only a Technical Issue

It involves processes, governance, and collaboration across teams to ensure that the data is accurate, reliable, and valuable for decision-making.

More Data Equals Better Quality

Without proper validation, relevance, and management, it can lead to noise, inconsistency, and misleading conclusions.

Automated Tools Alone Ensure Data Quality

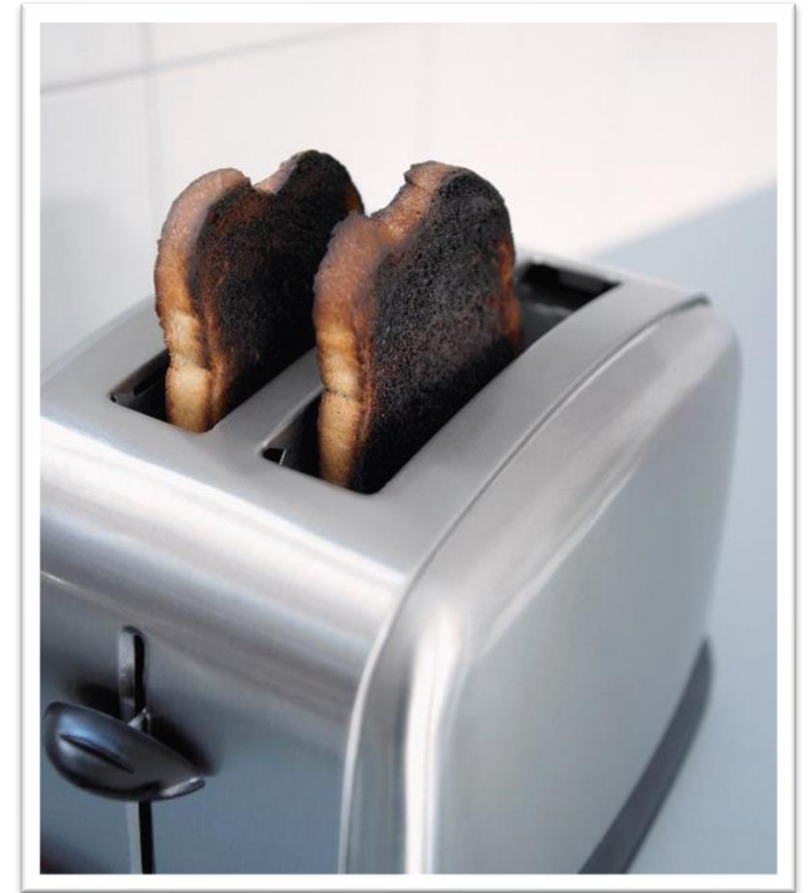
Human oversight, clear policies, and proper governance are essential to maintain accuracy and reliability.

Data Quality Initiatives Only Concern Data Teams

Quality affects and requires collaboration from all departments to ensure accuracy, consistency, and value across the organization.

Perfect Data Quality is Achievable

Quality can be maintained through continuous improvement, some level of errors, inconsistencies, and uncertainties will always exist.



Key Strategies to Overcome Quality Myths



Building Quality into Every Step of the Process

Embedding quality throughout the process to achieve excellence at every stage.

Promoting a Culture of Quality Across the Organization

Encouraging a mindset of excellence and accountability in every aspect of the work environment.

Training and Continuous Improvement in Quality Standards

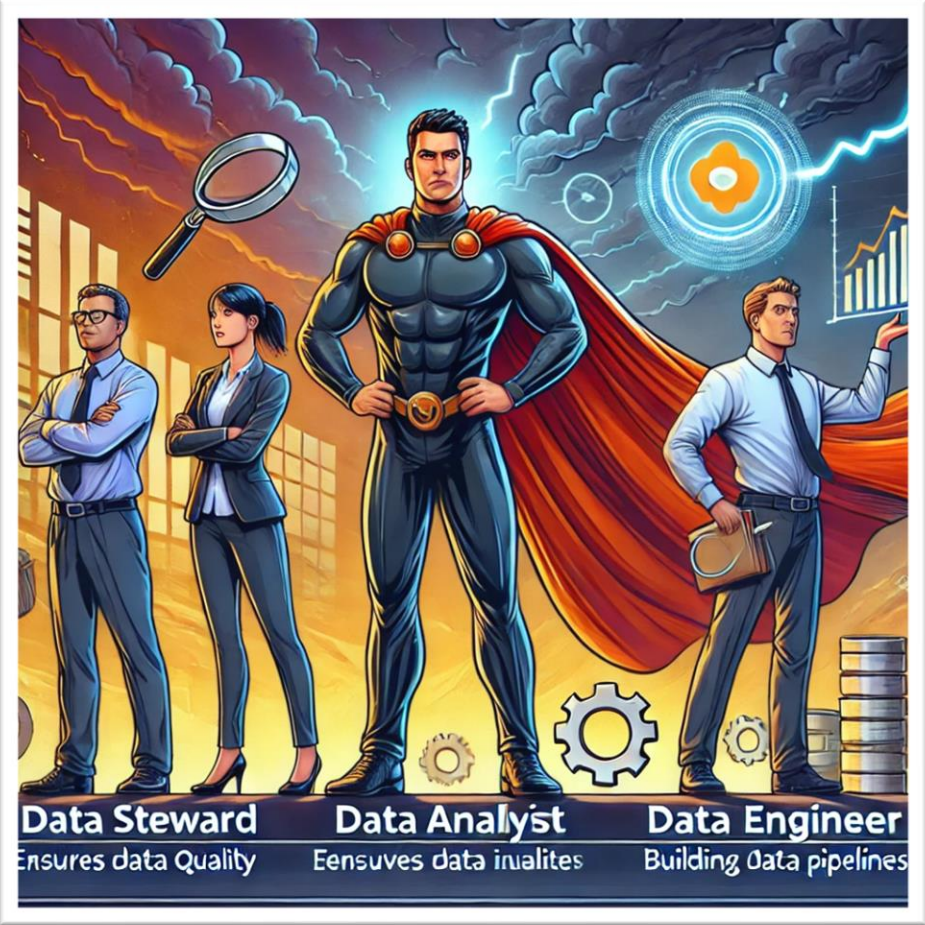
Investing in training and ongoing improvement to uphold and enhance quality standards.

Implementing Balanced Process and Data Quality Measures

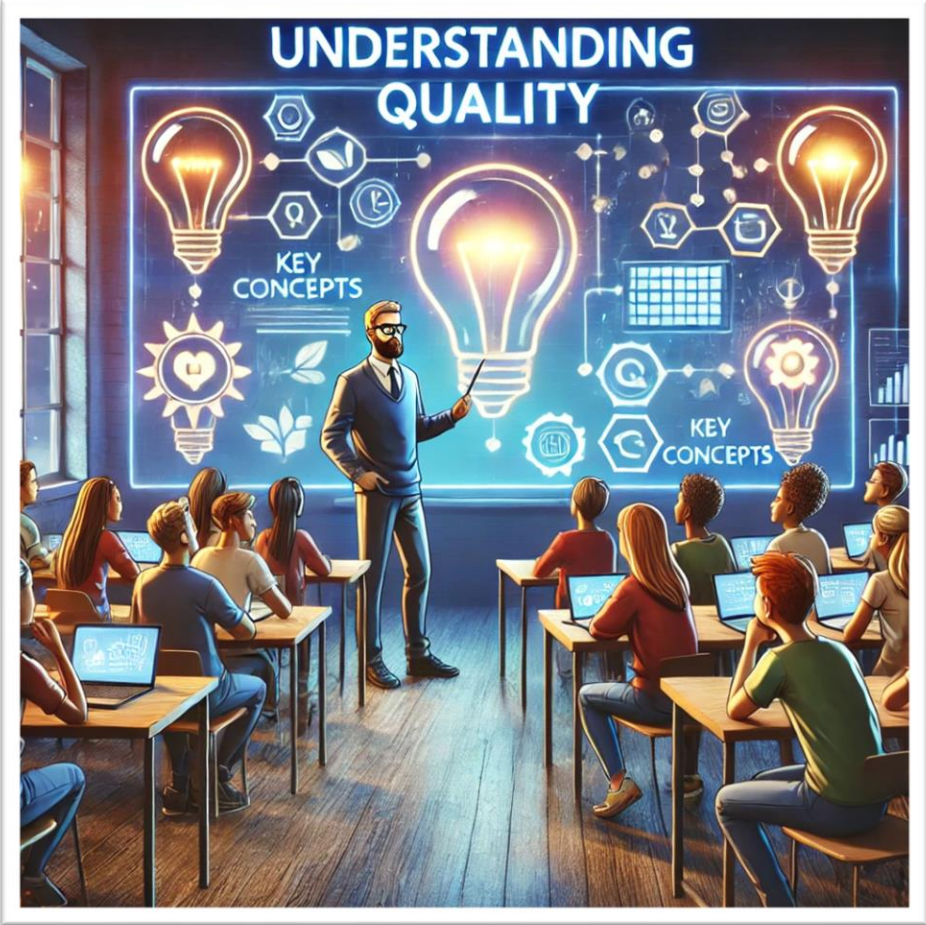
Establishing a balanced approach to process efficiency and data quality for optimal performance.

Mix of Policies, Patience, and Wishful Thinking

What we like to be



What really need to be done

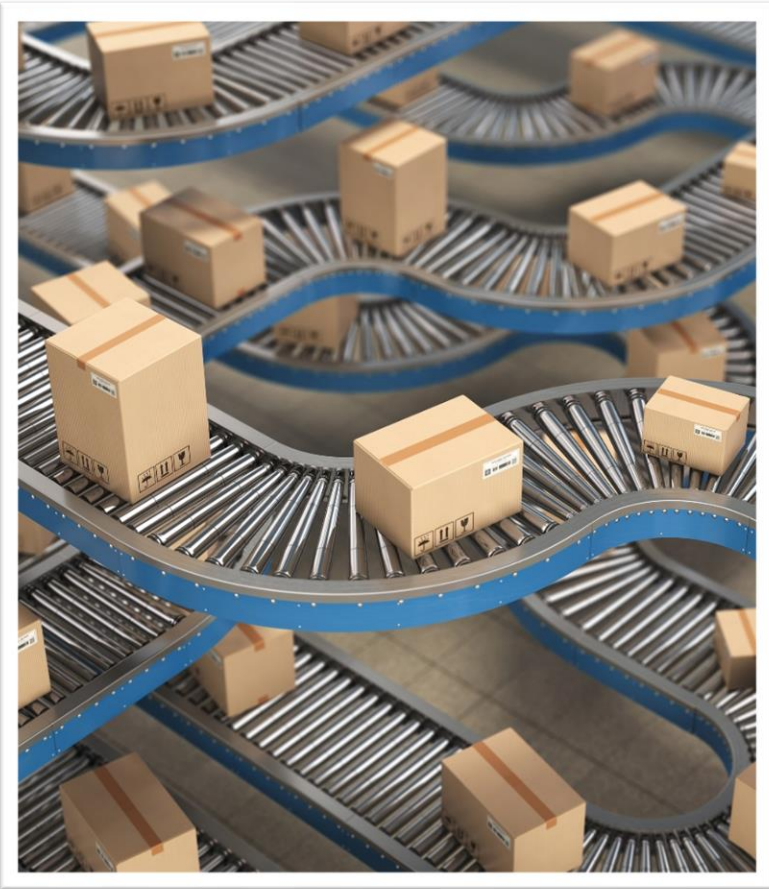


Getting Started with Data Management

Data management is the systematic process of collecting, storing, organizing, and maintaining data to ensure its accuracy, accessibility, and security.



Because 'Guesswork' Isn't a Data Strategy



Context in Data Management: Understanding data management ensures accurate interpretation, alignment with business goals, and informed decision-making.

Differentiation from Software Management: Software management focuses on development and maintenance, while Data Management ensures governance, quality, and lifecycle integrity.

Challenges in Data Management: Common challenges include ensuring data quality, maintaining security and compliance, integrating diverse sources, and managing scalability.

Weaknesses in Current Data Management Practices: Current weaknesses – poor data quality, lack of governance, security vulnerabilities, integration challenges, and scalability limitations.

Targets and Goals for Effective Data Management: Ensure data quality, security, and alignment with business goals to drive informed decisions.

Best Practices in Data Management: Maintaining data quality, ensuring security and privacy, optimizing accessibility, and aligning data strategies with business objectives.

Considerations for Data Management Strategies: Data management strategies should consider alignment with organizational goals.

Understanding Context in Data Management

The context refers to the specific circumstances, environment, and factors that influence how data is collected, stored, processed, and used within an organization.

This includes the purpose for which the data is gathered, the sources from which it originates, the stakeholders who interact with it, and the regulatory and legal frameworks that govern its use.

Context also encompasses the organizational goals, industry standards, and technological infrastructure that shape data management practices.



Differentiation from Software Management 2/2

| Category | Data Management | Software Management |
|----------------|--|---|
| Focus | <ul style="list-style-type: none"> Managing and organizing data assets | <ul style="list-style-type: none"> Developing, maintaining, and deploying software applications |
| Objectives | <ul style="list-style-type: none"> Ensuring data quality and integrity Data security and privacy Compliance with regulations Data - driven decision making Enhancing data accessibility Enhancing data usability | <ul style="list-style-type: none"> Functional and reliable software Meeting user requirements Ensuring software performance Maintaining code quality Managing software updates and patches |
| Processes | <ul style="list-style-type: none"> Data collection Data cleansing Data integration Data storage and archiving Data governance and steward | <ul style="list-style-type: none"> Requirements gathering Software design Coding Testing and debugging Deployment and maintenance |
| Considerations | <ul style="list-style-type: none"> Accuracy, consistency of data Data privacy and compliance Data lifecycle management Data interoperability | <ul style="list-style-type: none"> Software development methodologies (e.g., Agile, Waterfall) Code version control Bug tracking and resolution Software documentation |
| Roles Involved | <ul style="list-style-type: none"> Data Owners Data Stewards Data Analysts Data Engineers Data Scientists | <ul style="list-style-type: none"> Software Developers QA/Test Engineers Product Managers DevOps Engineers System Administrators |
| Tools Used | <ul style="list-style-type: none"> Databases (SQL, NoSQL) Data warehouses Data lakes ETL tools (Extract, Transform, Load) Data governance platforms | <ul style="list-style-type: none"> IDEs (Integrated Development Environments) Source control (e.g. Git) CI/CD tools Issue trackers Testing frameworks |
| Challenges | <ul style="list-style-type: none"> Ensuring data quality at scale Data privacy and compliance with regulations Managing large volumes Integrating disparate data sources | <ul style="list-style-type: none"> Handling software complexity Ensuring software reliability Ensuring software performance Managing dependencies Keeping up with technological advancements |

Fundamentals of Data Management

It encompasses a broad range of activities designed to optimize the use of data within an organization, ensuring that it is available for decision - making, analysis, and operational needs.



Weaknesses in Current Data Management Practices



Many organizations face significant weaknesses in their current data management practices. Despite the growing emphasis on data as a strategic asset, outdated or inadequate data management approaches often hinder an organization's ability to fully leverage its data.

- Lack of Standardization
- Insufficient Data Governance
- Overreliance on Legacy Systems
- Gaps in Data Security Protocols
- Limited Scalability
- Poor Data Literacy Among Stakeholders
- Ineffective Use of Metadata



Gaps in Data Security Protocols

- The Illusion of Compliance
- Out of Sight, Out of Mind
- Overconfidence in Tech
- Security Fatigue
- Low-Impact: Until It's Too Late

Chaos Computer Club:

<https://youtu.be/iHsz6jzjbRc>

Anne Roth – Digital Force:

<https://youtu.be/NNu8iaySjPI>

Foto: Dmitry Ratushny / Unsplash

Best Practices in Data Management

Implementing Robust Data Governance Frameworks

Implementing robust frameworks ensures data accuracy, security, compliance, and accountability across its lifecycle, aligning with organizational policies and regulations.

Utilizing Data Quality Tools and Techniques

Ensures the accuracy, consistency, and reliability of data, enabling better decision-making and operational efficiency.

Adopting Advanced Data Integration Solutions

Enables seamless data flow across systems, improving data accessibility, consistency, and insight generation.

Continuous Monitoring and Improvement of Data Security

The protection of sensitive information, mitigates risks, and maintains compliance with evolving regulations.

Regular Training and Development for Data Literacy

This enhances employees' ability to understand, interpret, and utilize data effectively, driving informed decision-making across the organization.

Embracing Cloud Solutions for Scalability and Flexibility

Allowing organizations to efficiently manage growing data needs while optimizing cost and performance.



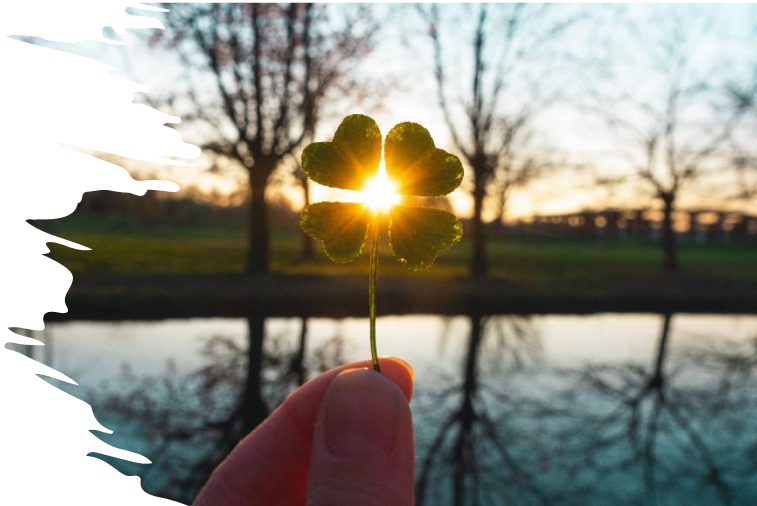
Guideline to Data Management SPICE

The Data Management SPICE PAM is designed to provide organizations with a framework for assessing and improving their data management processes.

Drawing inspiration from the well - established Automotive SPICE® (ASPICE®) model, this adapts the principles of process capability and maturity assessment specifically for data management, ensuring alignment with the highest standards of efficiency, security, and quality.



Introduction to Data Process Assessment



Key Concepts and Definitions

Clarity on the fundamental terms and ideas that underpin the assessment process, ensuring a common understanding and facilitating a thorough evaluation of data management practices.

Comparison with SW Process Assessment Models

Both types of assessments aim to enhance effectiveness, but they focus on different aspects of organizational operations.

Benefits of Data Process Assessment

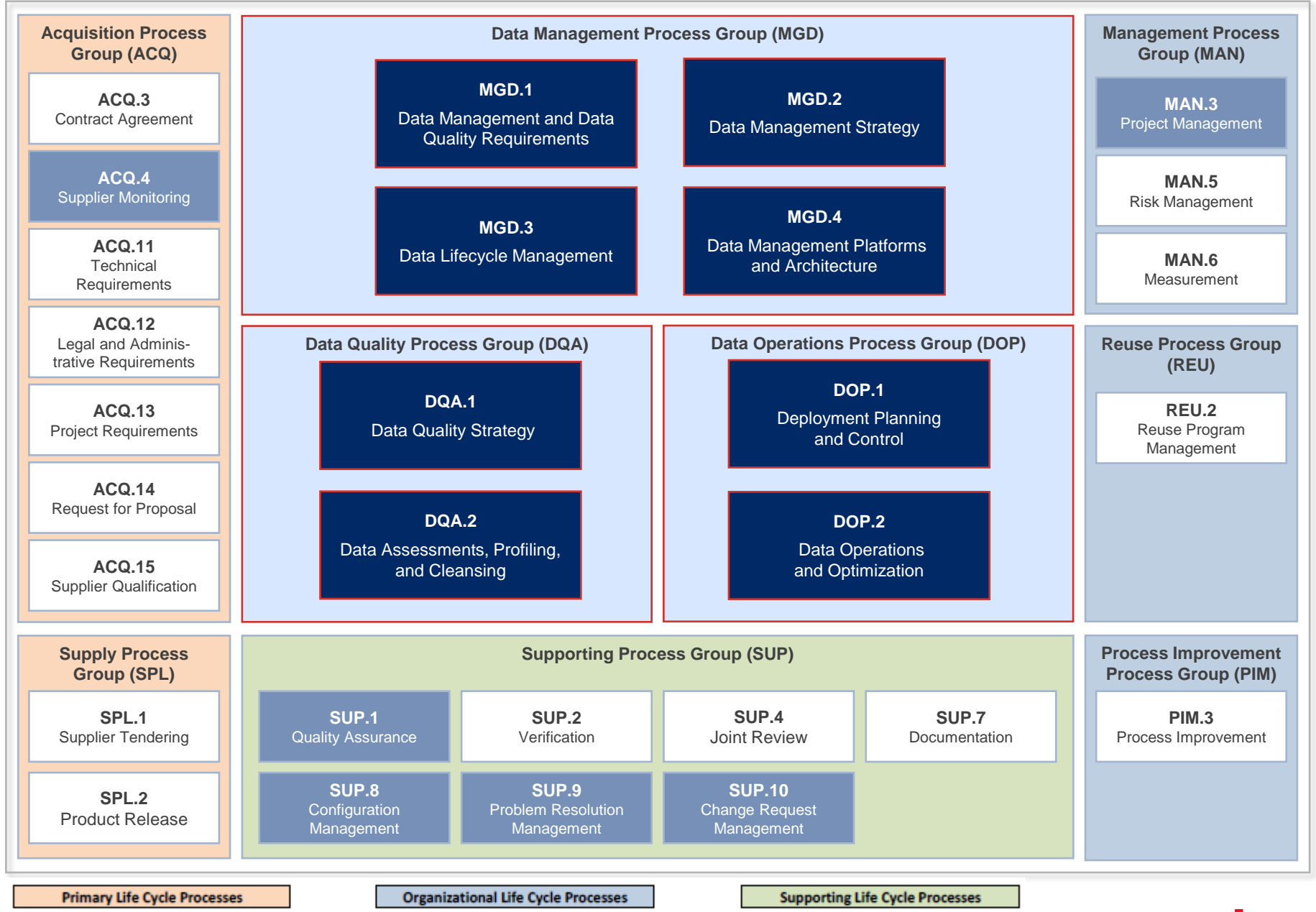
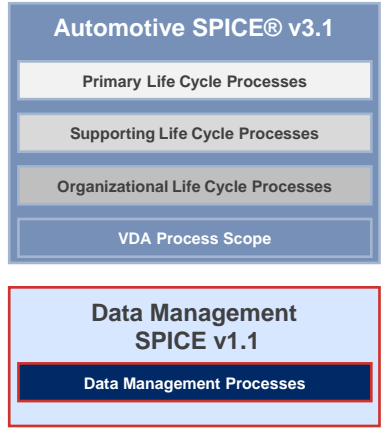
A data process assessment offers numerous benefits by systematically evaluating an organization's data management practices.

This detailed assessment helps organizations optimize their data operations and leverage data as a strategic asset.

Data Management SPICE v1.1

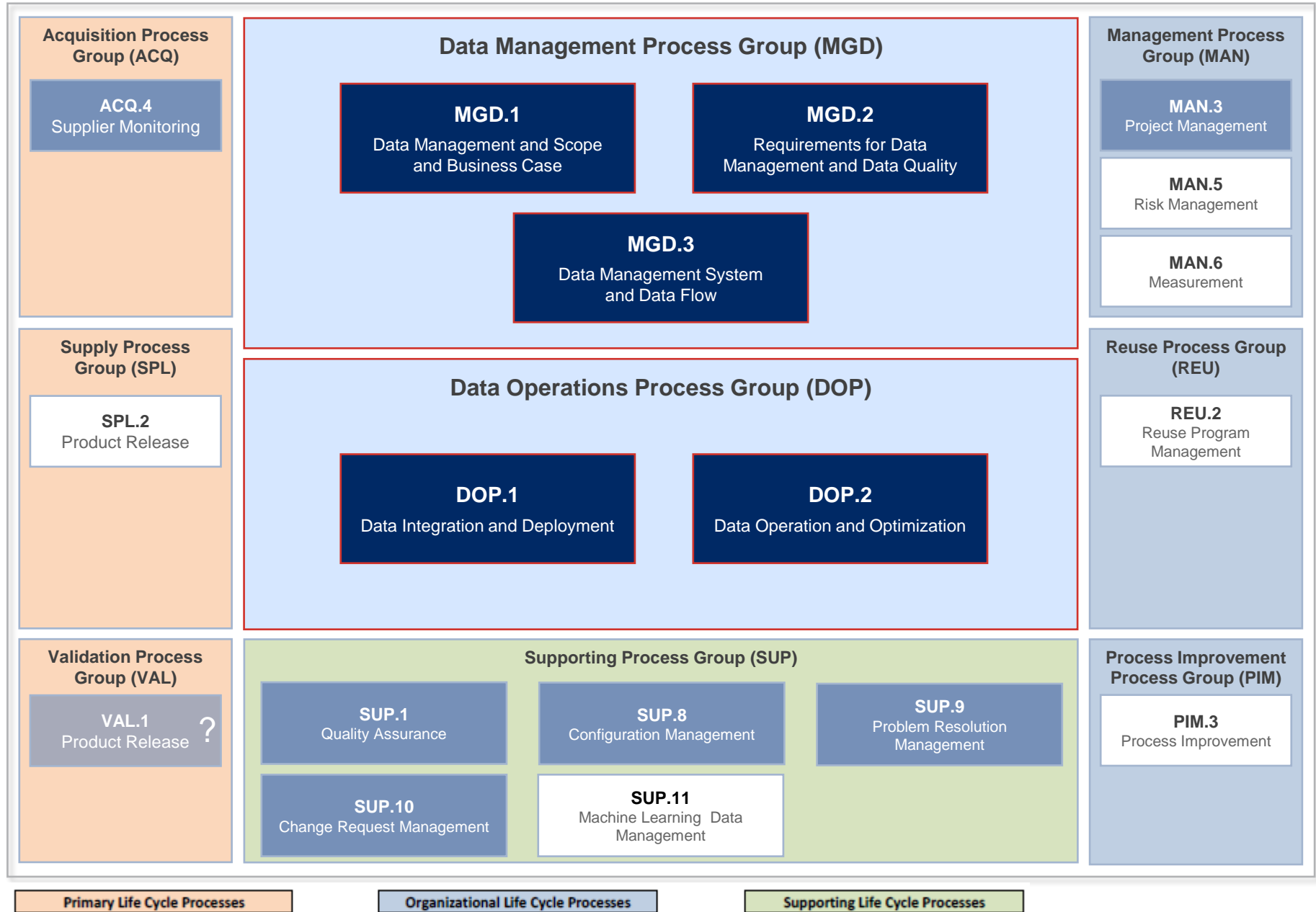
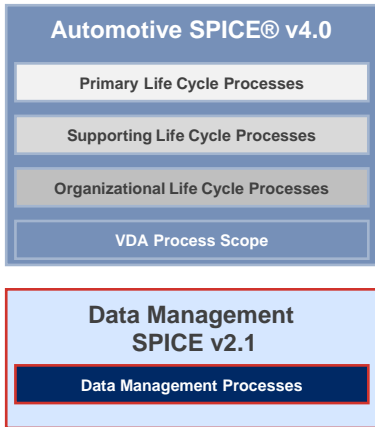
in context of Automotive SPICE® 3.1

update for context Automotive SPICE® 4.x on the way



Data Management SPICE v2.1

in context of Automotive SPICE® 4.0



Catena-X vs. Data Management SPICE vs. Digital Acts EU

While all approaches address aspects of data management, they target very different goals



Catena-X

Is a tangible, operational data ecosystem for the automotive sector aimed at enabling cross-company collaboration and standardized data flows.

Picture Source: <https://catena-x.net/>

Data Management SPICE

Is a methodological framework used to assess and improve data management processes, applicable across industries and focused on internal process maturity and continuous improvement.



Picture Source: Data Management SPICE PRM_PAM v1.1.pdf – downloadable @ www.intacs.info



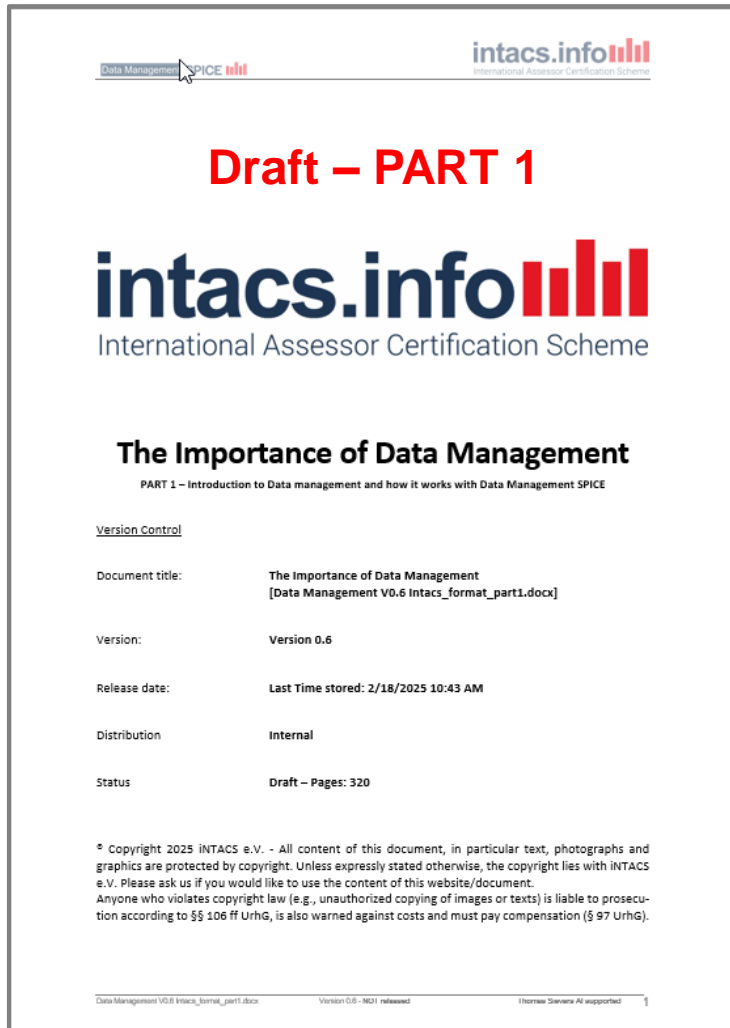
Digital Acts EU

The Digital EU Acts are a set of legislative measures by the European Union aimed at shaping a safer, fairer, and more competitive digital environment.

Picture Source: <https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/digital-services-act>

Knowledge – The Importance of Data Management

First draft steps prepared, further, to come



Driven by Experience

- Why Data is Not Software
- Motivation
- Introduction to Data Management
- Guideline to Data Management SPICE
- ... and more

Assessment Process- and how AI see the world



Integration with other e.g. ISO Standards

Aligning with ISO Standards (e.g., ISO 8000, ISO 27001)

Objective: To align the organization's data management processes with relevant ISO standards, such as ISO 8000 (Data Quality) and ISO 27001 (Information Security Management), to enhance data quality, ensure information security, and achieve compliance with international best practices.

This alignment will improve data governance, operational efficiency, and stakeholder confidence.

Integrating with ITIL, COBIT, and Other Frameworks

Objective: To develop an integrated approach that aligns data management processes with ITIL (Information Technology Infrastructure Library), COBIT (Control Objectives for Information and Related Technologies), and other relevant frameworks.

This integration will ensure comprehensive governance, streamlined service delivery, and enhanced data security and quality, leading to improved decision - making, risk mitigation, and operational efficiency.

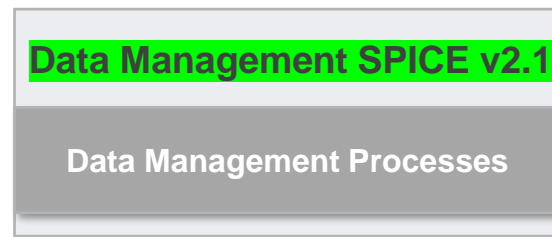
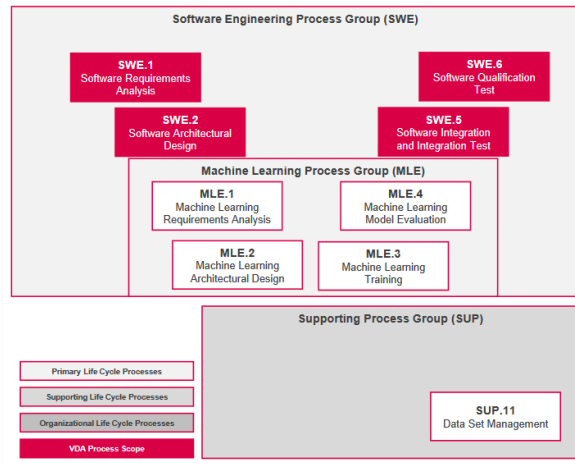
Integration with ASPICE® PRMs/PAMs

Combine the Process Framework for DMS and ML

Objective: Integrating data management and machine learning processes is essential for organizations seeking to harness the full potential of their data assets.

Combine the Framework for DMS and IT Service

Objective: Organizations are increasingly recognizing that effective management of data and robust IT services are interdependent components of a successful digital strategy.



| SPICE for IT-Services V4 - IT Service Management Lifecycle Processes | |
|--|--|
| TOP – Top Management Processes | |
| TOP.1 Establish the SMS Context and Scope | TOP.2 Leadership |
| SMS – Processes: | |
| SMS.1 Planning for the Service Management System | SMS.7 Human Resource management |
| SMS.2 SMS establishment | SMS.8 Documentation Management |
| SMS.3 Service delivery and operation of the SMS | SMS.9 Service reporting & Performance Evaluation |
| SMS.4 Non-conformity management | SMS.10 Audit |
| SMS.5 Continual Improvement | SMS.11 Management review |
| SMS.6 Risk management | SMS.12 Process establishment *) |
| | SMS.13 Infrastructure management *) |
| RAA - Relationship and Agreement Processes: | |
| RAA.1 Business relationship management | |
| RAA.2 Service level management | |
| RAA.3 Supplier management | |
| RAA.4 Service portfolio & catalogue management | |
| SDB - Service Design, Build & Transition Process: | |
| SDB.1 Service requirements | |
| SDB.2 Service design | |
| SDB.3 Service build and transition | |
| SDB.4 Release & deployment management | |
| SAD – Supply and demand processes: | |
| SAD.1 Budgeting and accounting for services | |
| SAD.2 Demand management | |
| SAD.3 Capacity management | |
| RES - Resolution and Fulfillment Processes: | |
| RES.1 Incident management | |
| RES.2 Service request management | |
| RES.3 Problem management | |
| SAS – Service Assurance Processes: | |
| SAS.1 Service availability management | |
| SAS.2 Service continuity management | |
| SAS.3 Information security management | |
| CON - Control Processes: | |
| CON.1 Change management | |
| CON.2 Configuration management | |

Source: Kugler Maag CIE by UL-Solutions, VDA Sys 2022 presentation: "SPICE for Machine Learning"

Data management provides the foundation by ensuring the collection, storage, quality, and governance of data, while machine learning builds on that foundation by utilizing algorithms to extract insights and make predictions.

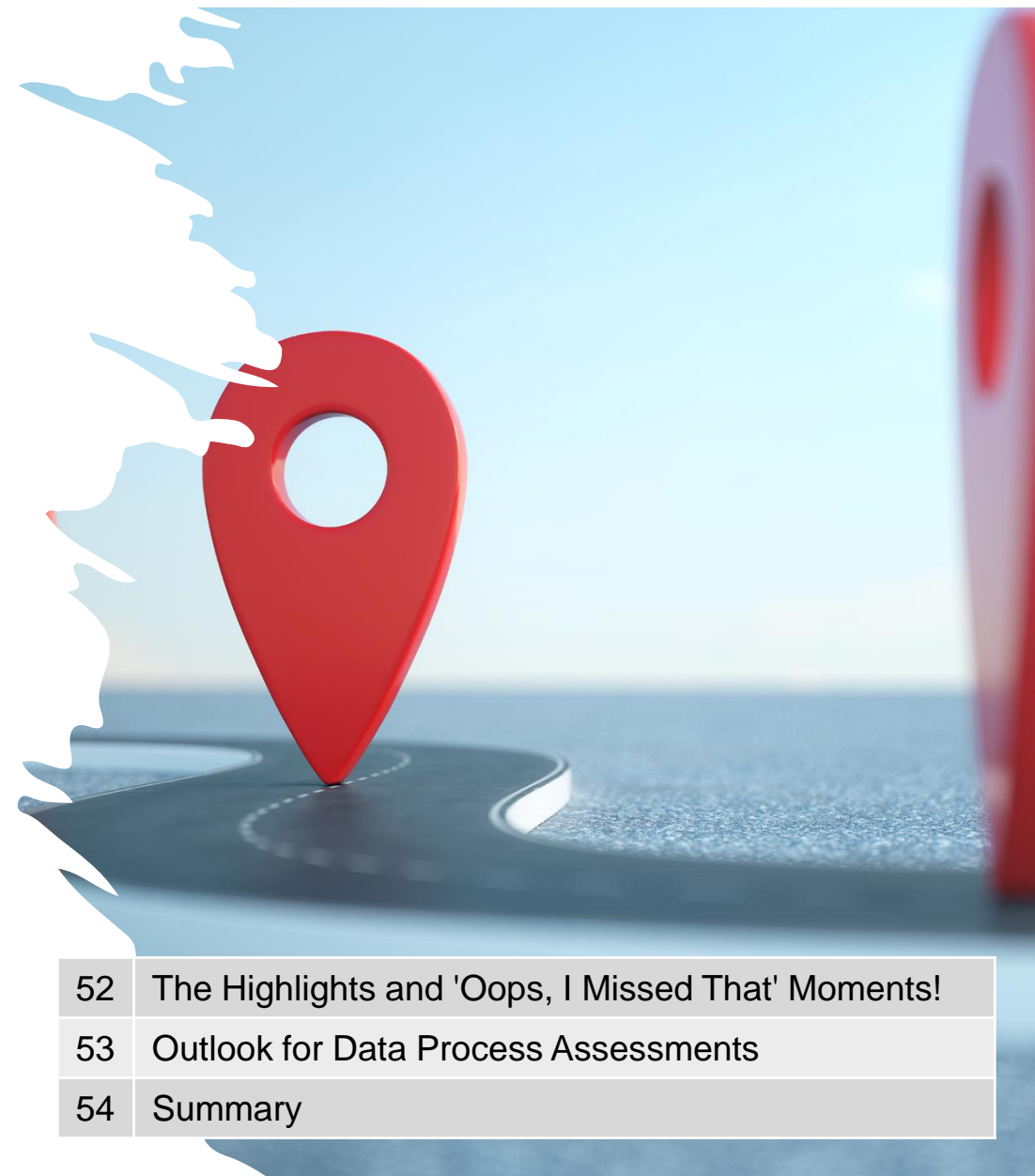
Source: INTACS®, SPICE for IT-Services – Process Reference- and Assessment Model Version 4.0 June 11th, 2022

Combining these frameworks involves aligning data management practices with IT service management (ITSM) processes to create a unified approach that enhances data integrity, supports informed decision - making, and delivers superior service quality.

Conclusion

Data management serves as the foundation of modern organizations, driving informed decision - making, operational efficiency, and long - term success.

By understanding the principles and processes of data management, organizations can transform raw information into valuable assets, enabling smarter business strategies and enhanced performance.



| | |
|----|---|
| 52 | The Highlights and 'Oops, I Missed That' Moments! |
| 53 | Outlook for Data Process Assessments |
| 54 | Summary |

Outlook for Data Process Assessments

| Key Elements | Description |
|---|--|
| Emerging Technologies Integration | Enhanced integration with AI, <u>machine learning</u> , and other emerging technologies to support sophisticated <u>data analysis</u> and improve assessments. |
| Focus on Data Privacy and Security | Increased <u>emphasis on data privacy</u> and security due to evolving regulatory landscapes like GDPR and CCPA. |
| Real-Time Monitoring | Adoption of <u>real-time monitoring</u> and assessment tools to provide continuous feedback and ensure <u>data integrity and compliance</u> . |



Summary



Understand: Data Management as an emerging discipline



Awareness: Base definitions for Data & Data Management



You got: 30000 feet view on Data Management SPICE



Be open: Scenario for discussions in your own context





DO YOU HAVE ANY QUESTIONS?

© intacs®. All rights reserved. The copying, use, distribution or disclosure of the confidential and proprietary information contained in this document is strictly prohibited without prior written consent. Any breach shall subject the infringing party to remedies.

Icons: <http://www.1001FreeDownloads.com> Photos: www.unsplash.com, Fotolia.de, kasko, Pixabay, Freepik.com

intacs® | Herderstr. 7 | 51147 Cologne | Germany | www.intacs.info | office@intacs.info