What is Systems Management?

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Complexity is free

Blog: https://www.linkedin.com/pulse/complexity-free-vineet-khosla/
Picture: https://rickrobinson.files.wordpress.com/2012/10/it-systems.jpg

What keeps the CIO up at night?

Outages and negative press are costly

- May lead to loss of reputation
- And loss of business
- Or even bankruptcy

Challenges

- Increasing complexity of the IT-infrastructure
- More frequent changes
- Budget pressure
- Demographic change
- 24x7 availability and resiliency

Systems Management

Centralized administration of the information technology (IT) systems in an enterprise network or data center

Visibility, control, and automation of data center IT-components including cloud services

Facilitates the delivery of IT as a service

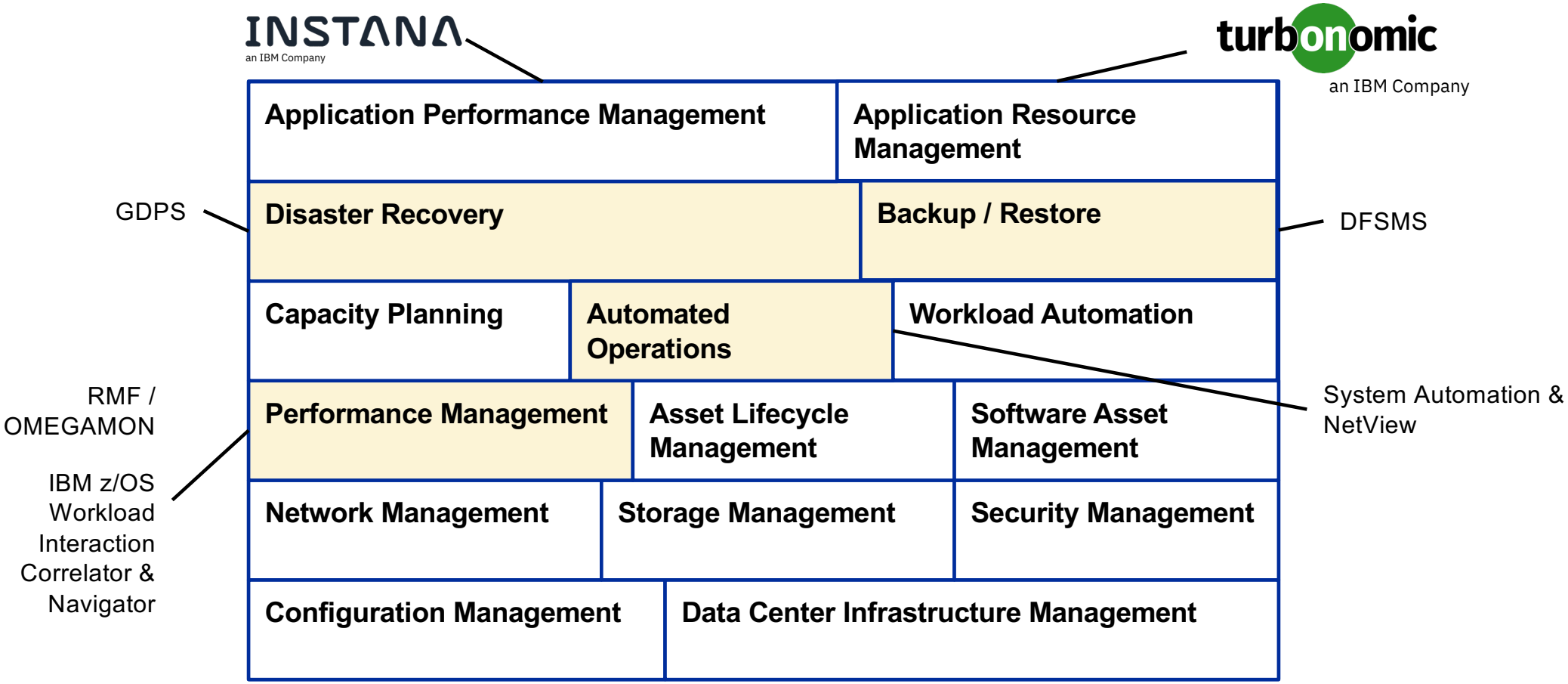
Strongly influenced by network management in telecommunications

Large spectrum of systems management specializations

Systems Management specializations

Application Performance Management	**Application Resource Management**	
Disaster Recovery	**Backup / Restore**	
Capacity Planning	**Automated Operations**	**Workload Automation**
Performance Management	**Asset Lifecycle Management**	**Software Asset Management**
Network Management	**Storage Management**	**Security Management**
Configuration Management	**Data Center Infrastructure Management**	

Systems Management specializations



Systems Management vs. Service Management

Comparison

Systems Management focus

Selection and deployment of tools to gain insights into IT-components and workloads and to control them

Operations of IT-components and workloads

- Frictionless
- Efficient
- At scale

Optimizing resource utilization within budget and availability requirements

supports

Service Management focus

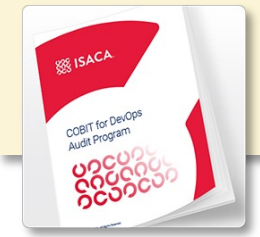
Ability to generate value for your customers by providing services

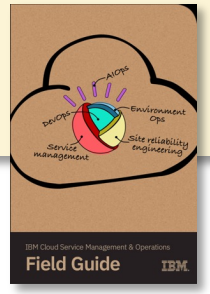
Joining People, Processes and Tools

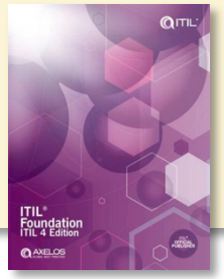
Service strategy

Design, transition, and operations of services

Continues improvement







FCAPS Systems Management framework

Influenced by Network Management in Telecommunications

Evolved since the early 1980s and submitted 1992 as CCITT Recommendation X.700 Management framework for Open Systems Interconnection (OSI) for CCITT Applications (see also ISO/IEC 10040)

Five functional areas (FCAPS)

Fault management	Configuration Management	Accounting management	Performance Management	Security Management
– Error logs – Notifications – Tracing, isolation – Correction	– Catalog of managed systems and their parameters – Discovery – Plan and perform changes	– Measure resource consumption – Bill user / dept. by consumption	– Gather statistical information – Real-time vs. historical data – Thresholding	– Access management – Audit log – Incident reporting

Other influences

Two examples

Desktop Management Task Force (DMTF)

Non-profit standards organization

Defines open standards covering management of traditional IT-compute, network, and storage infrastructure

But also covering management of converged and hybrid IT, cloud and virtualization

Prominent examples are

- Common Information Model (CIM)
- Web-Based Enterprise Management (WBEM)
- Cloud Infrastructure Management Interface (CIMI)

Computer Measurement Group (CMG)

Non-profit user organization founded in 1970s

User group of professionals focusing on measuring and managing the performance of computing systems

Provides education, networking about methodology and forum for ideas and requirements

Its technical publications include many legendary papers on performance

z/OS System Management Facility

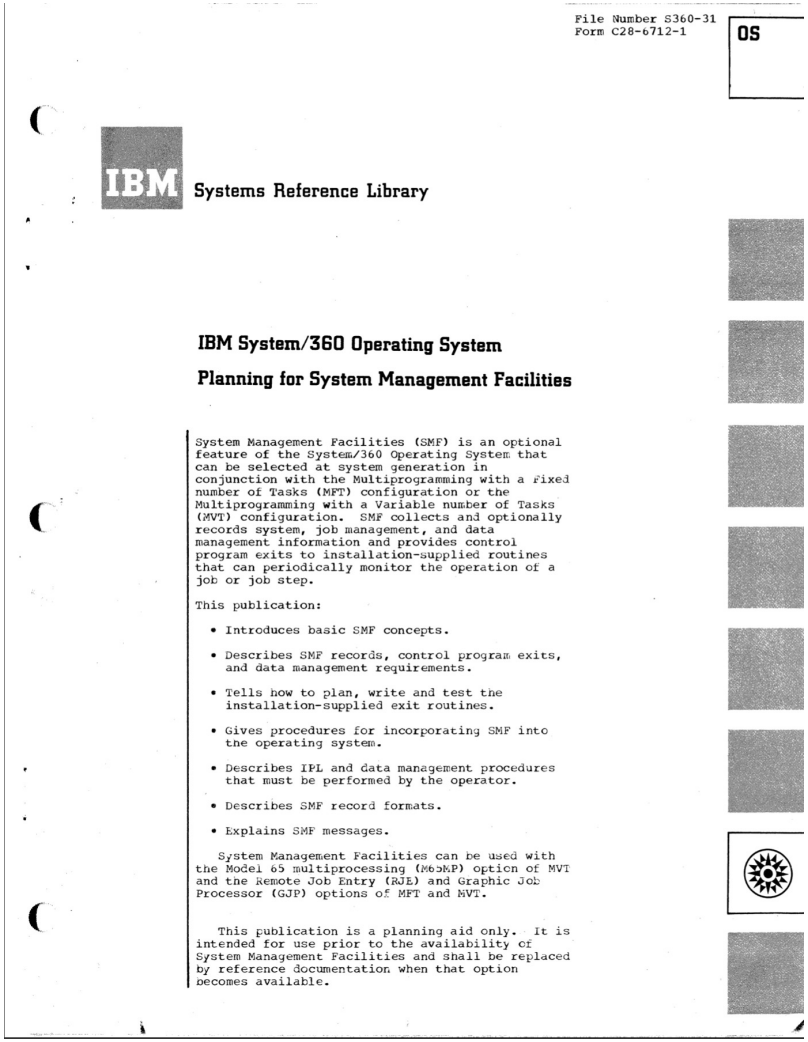
z/OS component for collecting and recording system and job-related information for billing, activity and reliability reporting, profiling and security

Since /360 days (1960s)

De-facto standard on z/OS and backbone for any of today's systems management task on z/OS

z/OS V2.5 distinguishes 129 different record types with more than 150 subtypes

Rich ecosystem of "post-processing" tools, both on-platform and off-platform



File Number S360-31
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OS

IBM Systems Reference Library

IBM System/360 Operating System

Planning for System Management Facilities

System Management Facilities (SMF) is an optional feature of the System/360 Operating System that can be selected at system generation in conjunction with the Multiprogramming with a Fixed number of Tasks (MFT) configuration or the Multiprogramming with a Variable number of Tasks (MVT) configuration. SMF collects and optionally records system, job management, and data management information and provides control program exits to installation-supplied routines that can periodically monitor the operation of a job or job step.

This publication:

- Introduces basic SMF concepts.
- Describes SMF records, control program exits, and data management requirements.
- Tells how to plan, write and test the installation-supplied exit routines.
- Gives procedures for incorporating SMF into the operating system.
- Describes IPL and data management procedures that must be performed by the operator.
- Describes SMF record formats.
- Explains SMF messages.

System Management Facilities can be used with the Model 65 multiprocessing (M65MP) option of MVT and the Remote Job Entry (RJE) and Graphic Job Processor (GJP) options of MFT and MVT.

This publication is a planning aid only. It is intended for use prior to the availability of System Management Facilities and shall be replaced by reference documentation when that option becomes available.

Systems Management isn’t a Free Lunch

Cost of acquiring, deploying, and running systems management tools

Training of IT-staff

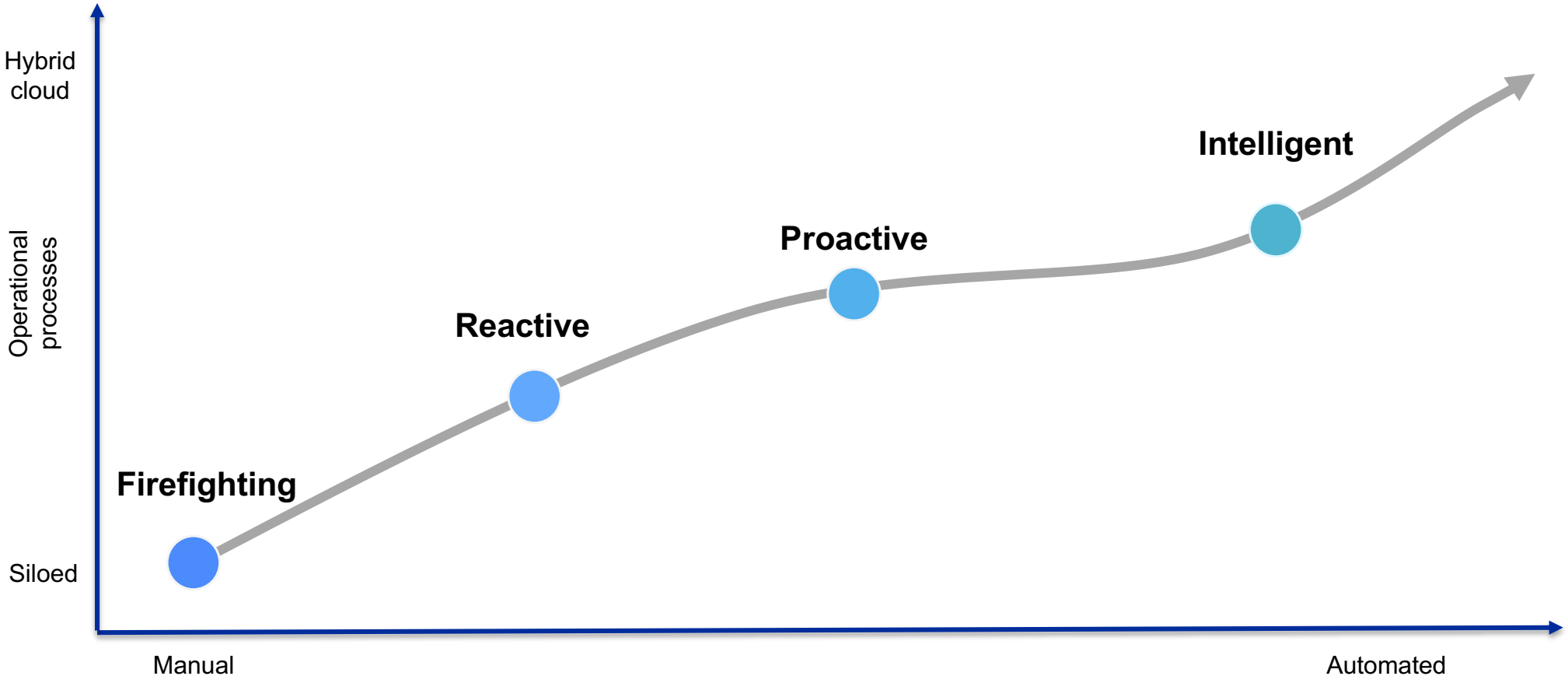
Tools must be upgraded as rest of system changes

Security

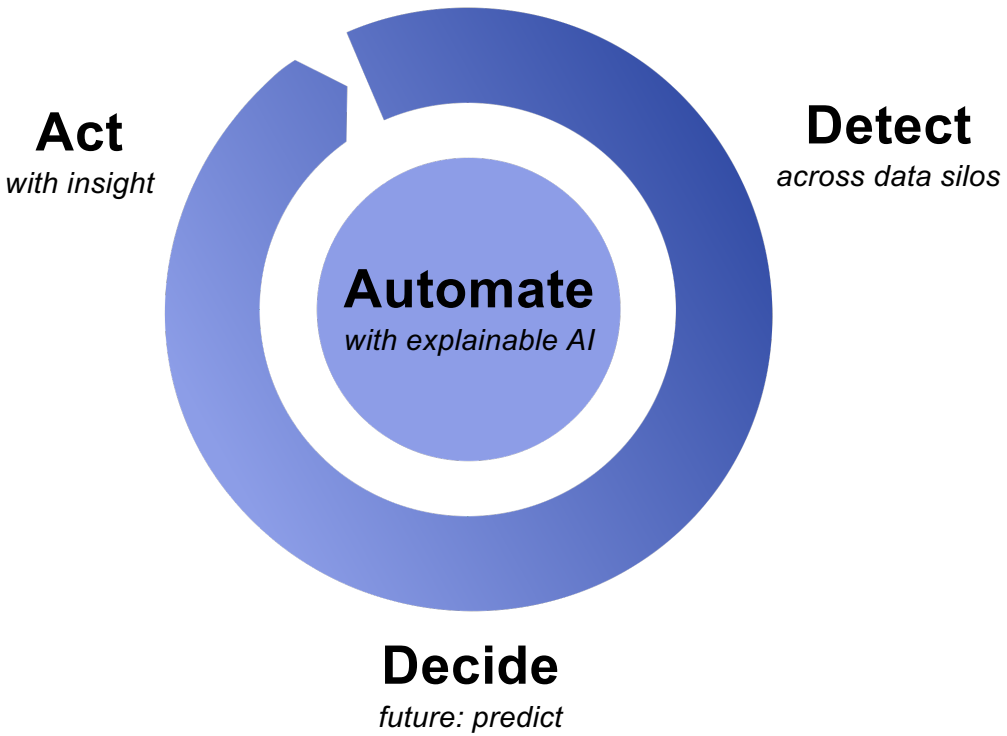
Interoperability of tools, e.g., across platform

Lack of automation in tools and processes

Journey to AIOps – Four stages of maturity



AI-powered automation drives operational resiliency and speed



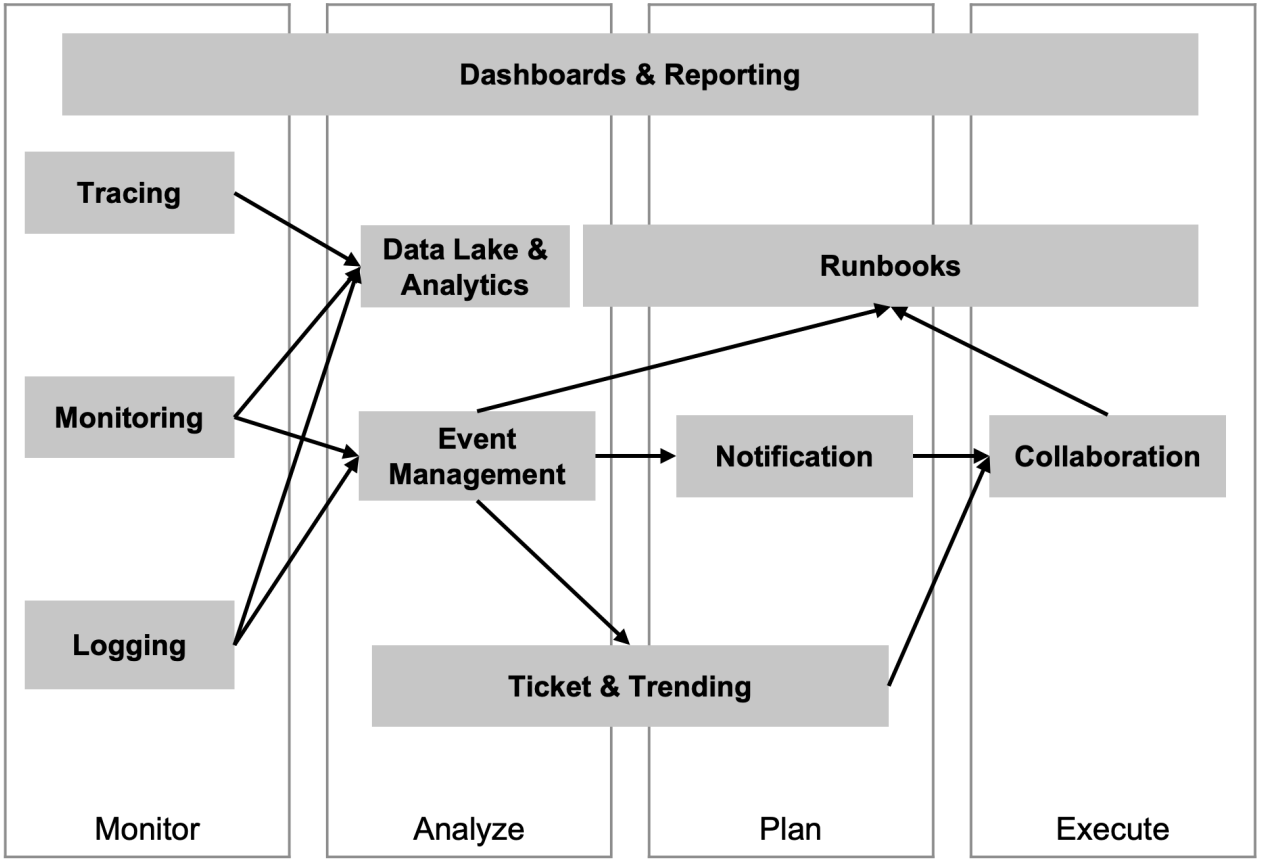
Detect: Monitor hybrid infrastructure and applications and detect issues and anomalies

Decide: Analyze issues and anomalies to isolate problems and identify root causes

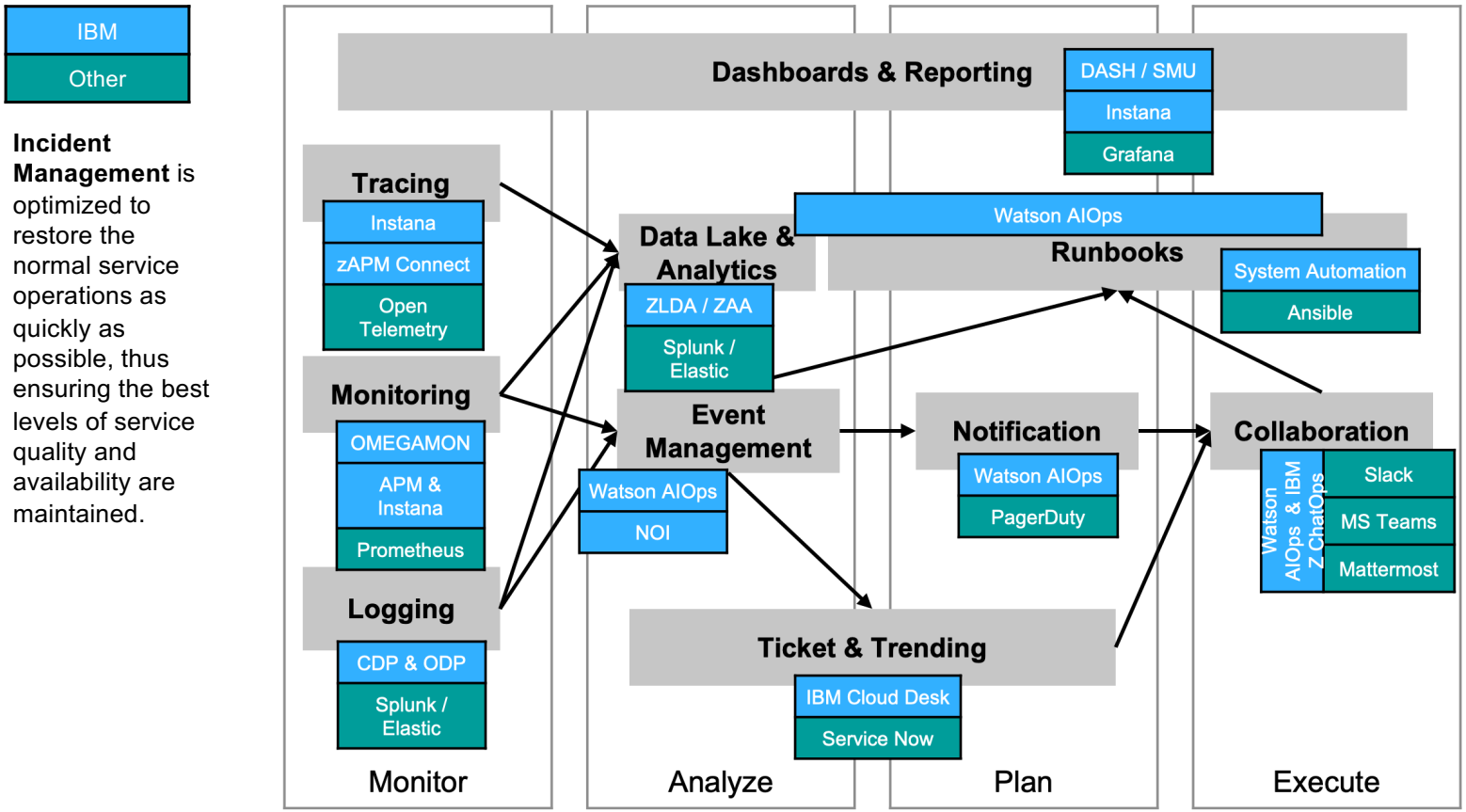
Act: Rapidly respond to reduce impact on the customers with improved resiliency

Example: Incident Management

Incident Management is optimized to restore the normal service operations as quickly as possible, thus ensuring the best levels of service quality and availability are maintained.



Example: Incident Management



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IBM Cloud Pak for Watson AIOps

AIOps on IBM zSystems Framework

Detect

Monitoring & observability

Full-stack monitoring with best practices for early detection of Z incidents

Application performance management

End-to-end tracking visibility across hybrid cloud application

Anomaly detection

Intelligent anomaly detection to avoid costly incidents

Decide

Cross-domain metrics & trace analysis

Detect bottlenecks in code, server resources or with external dependencies

Log analytics

Accelerate hybrid incident identification with real-time operational analytics

Anomaly correlation

Correlate anomalous activities across z/OS subsystems

Performance & capacity planning

Performance analysis, capacity forecasting and modelling

Act

Collaborative incident remediation

Improved collaboration and faster incident resolution through chat-based operations and user-friendly dashboards

Intelligent automation

End-to-end, goal-driven and policy-based system automation for a consistent and reliable automation across the enterprise

Predictive workload automation

End-to-end workload automation with embedded predictive scheduling for SLA management

Storage automation

Machine aided storage resource management and automated storage tasks across the enterprise for improved SLAs

References

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Thank you

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