



Knowledge grows

YARA PRISMA Transition & Transformation (T&T) Program reflections for

→ *SBN Projects Day*

21.04.2021



Agenda

- About the presenters & Yara
- Intro to PRISMA Transition & Transformation (T&T) Project Objectives & Scope
- Findings from the Project
 - *PMO / Governance / Tooling, & Documentation*
 - *Application management*
 - *Integrations / Middleware*
 - *Infrastructure*
 - *The nightmare scenario*
- Q&A



About your presenters from Yara



Shawn Stone

IT Program Manager, ERP Unit at Yara Norge AS

- 28 years IS/IT Management Consulting, as well as ERP/SAP Application Management & Governance
Past 26 years focused on SAP related work (blueprint, design, build, test, implement, patch, upgrade, rollout, training, support, & optimization)
- Employed past 6,5 years at Yara International ASA as SAP IT Program Manager, ERP Unit with the following areas of FOCUS:
 1. Program & Project/Implementation Management
 2. ERP Application Management & Service Delivery (SAP ECC & future S4/Hana)
 3. Application Consulting (SAP MM/SCM, -- Materials Management -- Procurement, Inventory Control, Supply Chain Optimization, MRP, & Planning/IBP)
- Shawn was the Yara responsible Project Manager for PRISMA T&T



Prasanna Kumar Ganasala

Senior Manager - ERP Platform Services at Yara Norge AS

- ERP Platform Manager responsible for managing the platform and infrastructure of YARA SAP systems and responsible for securing the security and technical architecture of the SAP systems
- Managing & coordinating a team of local, offshore, business, and 3rd party consulting partner personnel to stabilize, run, support, and continuously improve a complex & significantly enhanced SAP system landscape of YARA which is the primary ERP solution for the global YARA business.
- Prasanna was the Yara responsible for SAP infrastructure & Middleware Track in the PRISMA T&T Program

About Yara

As of June 2020, [Yara operates under a regional organizational structure](#).

Yara's operations comprise four units (three regional units and one unit focused on global production plants and operational excellence). In addition, Yara has established a new global function - Farming Solutions.

As the world's leading fertilizer company and a provider of environmental solutions, we address global challenges and create positive change.



Yara Farming Solutions

The Farming Solutions function has a global mandate to drive the transformation of Yara's core crop nutrition business, developing both existing and new solutions including premium products, digital business, food value chain collaboration and climate-neutral solutions.



Yara's regional units

Yara Europe, Yara Americas and Yara Africa & Asia all operate in a fully integrated setup, comprising of production, supply chain and commercial operations. They produce and deliver existing Yara solutions in addition to commercializing and selling new offerings under the guidance of Farming Solutions.



Yara Global Plants & Operational Excellence

The Global Plants & Operational Excellence unit operates Yara's largest production plants in Porsgrunn (Norway) and in Sluiskil (the Netherlands) and drives operational improvement and competence development across Yara's production units.

Key facts: 2020

- Established as Norsk Hydro in 1905
- Demerged as Yara International ASA in 2004
- President & CEO, Svein Tore Holsether, since Sept. 2015
- Headquartered in Oslo, Norway
- Listed on the Oslo Stock Exchange
- About 17,000 employees
- Operations in over 60 countries

Key figures: 2020

- Revenues: USD 11.6 billion
- EBITDA: USD 2.2 billion
- Total deliveries: 38.1M tons
- Fertilizer deliveries: 29.0M tons
- Industrial product deliveries: 7.1M tons
- Ammonia trade: 2.0 million tons

Today's Topic @ SBN Projects Day

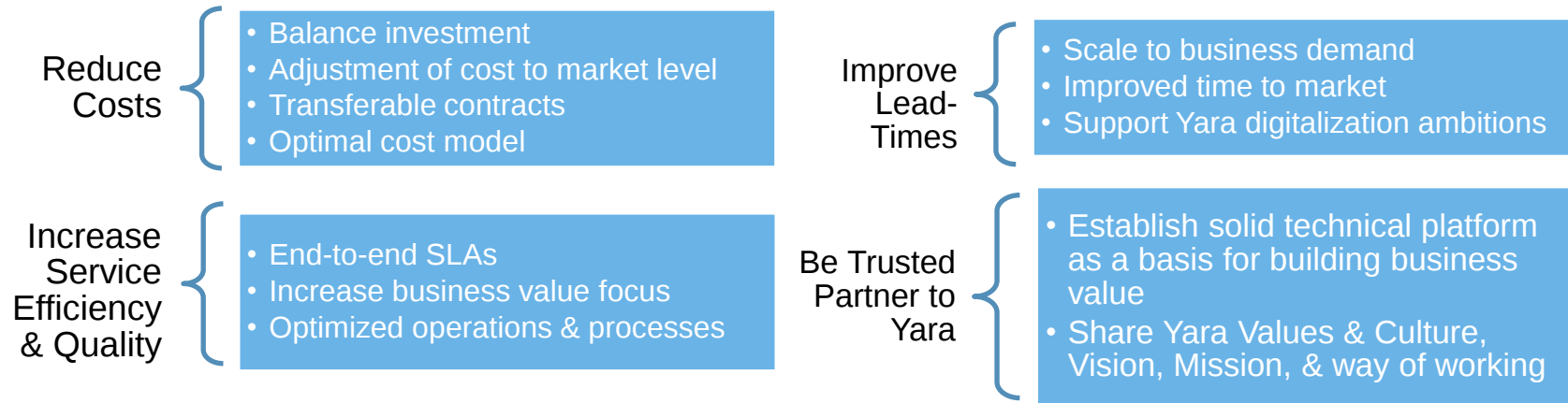
Yara's PRISMA Transition & Transformation Program

*(opportunities, challenges, & learning in changing AMS &/or
Infrastructure partners for SAP solutions):*

- PRISMA was an IT driven Program in Yara, requiring the migration and transformation of nearly 500 servers which supported about 200 business applications (many global in scope), including Yara's central finance & core ERP system, YSAP (SAP ECC).
- PRISMA also involved changing the incumbent, infrastructure and AMS supplier of more than a decade. The program completed successfully in 12 months and there are some key learnings for companies facing similar transition and transformations (T&T) of legacy systems and services.

PRISMA Objectives

PRISMA key objectives were to reduce costs & improve user satisfaction through shorter lead-times while continuing to meeting evolving business demands



PRISMA Background & Scope

A Transition & Transformation (T&T) program needed to be run to move Services & Infrastructure from an incumbent supplier with 10 years history (**VENDOR-S**) to a new supplier (**VENDOR-R**)

The PRISMA Project scope covered the Application Management Services (AMS) & Application Operations (AO) for some Applications, as well as Managed Hosting Services (MHS) for a larger set

Services were divided into Bundles where :

- **VENDOR-S** (as outgoing **Sender** / Incumbent) was Handing over to
- **VENDOR-R** (as incoming **Recipient** / New Vendor)



AMS 1- Bundle
SAP + Selected Business Applications
~43 total impacted applications

- Application Management
- Application Development
- Application Architecture Support
- Application Lifecycle Management services
- Application Operations for non-SAP applications

AMS 2- Bundle
MS SharePoint
9 total impacted applications

- Application Management
- Application Development
- Application Architecture Support
- Application Lifecycle Management services

Other Business Applications
Out of Scope
~148 total impacted applications

- All applications hosted by IBM will be migrated to the new partner
- List of all application affected can be found [here](#)

MHS Bundle

Managed Hosting Services
~200 total impacted applications

(455 Servers)

- Server (hybrid cloud), Storage & Backup, Database Management, SAP Basis, Application Operations, Middleware, Citrix, Co-location, Firewall, SMS and Fax Services and Hosting services for AMS1 and AMS2 Bundles

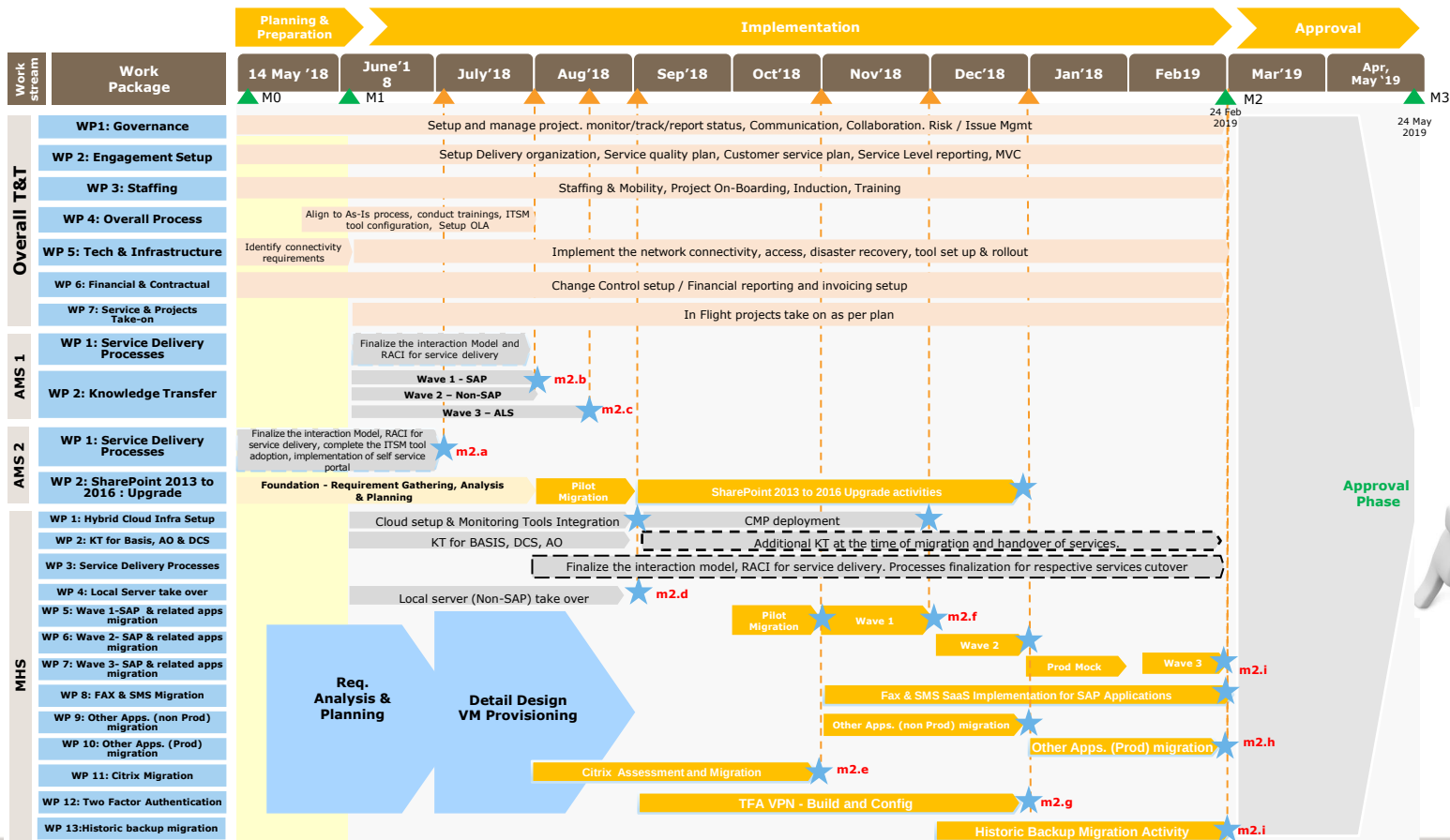
Out of Scope

- **Yara Brazil** – But Capability response expected
- **Yara India** – Partly Out of Scope – Capability Response expected
- **Connect Project** – applications in the scope of the project
 - End user services
 - Global Service Delivery
 - WAN
 - Multi Vendor Coordination
 - Configuration Management Database

PRISMA Team had representation from 20 nationalities and >700 persons involved at the peak period



PRISMA T&T Plan and Key Milestones – 1 year w/hard-stop limit



Note: m3 for each partial delivery shown as m2.(i) will be 3 months after commencement of services. Example: m3 for m2.a will be 7th Sep 2019

▲ Main Milestones

▲ Milestones for partial deliverables

★ Partial Deliveries

➡ Foundation Activities Transformation



PRISMA: What were the key pain points & subsequent Learnings?

1. PMO / Governance / Tooling / Documentation
2. AMS Service Handover - Applications
3. Integrations – Middleware & related findings
4. MHS Service Handover – Infrastructure
5. The nightmare scenario



PRIMSA – PMO / Governance / Tooling / Documentation



Good

1. We delivered to the original schedule & scope, even w/scope increase (& within budget frame). Eventually, and within time, we succeeded and doing so matured as an organization in knowing all our assets and landscapes.
2. Stakeholder Mngt in terms of App & Bus. Mngrs was well handled considering large scope
3. Good comms towards the rest of the org. + good engagement from various stakeholders (app manager, super user)
4. Great PMO team which tracked extensive onboarding (700+ persons), financials, deliverables, business case, & other aspects
5. Highly dedicated, motivated, & empowered team(s) w/prioritization of the project over other activities for all resources
6. Professionally behaved & well-managed VENDOR-S exit & good communication /relations with the incumbent

PRIMSA – PMO / Governance / Tooling / Documentation

Opportunity

1. Parallel project implications not adequately considered resulting in rework (ALS & Oracle 12 upgrade)
2. 10x underestimation of level of effort required from VEND-S & RACI / unclear work breakdown between vendors
3. Sense of urgency missing from VEND-R project team with a “we’ll figure it out” attitude at times
4. VEND-R attention to detail & ownership was lacking, requiring heavy unplanned attention from Yara (and VEND-S)
5. Multiple turnovers in Management resources created additional risks & gaps in responsibility/handover
6. Transition team was not familiar with the Contract &/or “buying in” to it (eg. unrealistic). Read the Contract !!!
7. Yara didn’t properly follow-up the “Actual” infra/HW implemented, resulting in large “Resizing” effort + Licensing impacts
8. Needed dedicated streams and higher focus on areas as Tech and infra, network, etc.; Asset mngt; Cyber security
9. Had principle to “Fix first discuss after” (e. commercials), but didn’t adhere to that as well as we should have
10. Hence, needed a better/firmer split between T&T execution and commercial/contractual discussions
11. Resources rolling on without knowing what was expected of them
12. Lack of retention of key personnel / critical knowledge
13. Project closure phase should have been better/more structured; don't offload the PM(s) until the job is done
14. We were building Service Now/ service desk same time as moving to VEND-R & over 2 years we have suffering for having both Yara IT and VEND-R discovering the new tools using not yet matured processes.
15. From BAU / RUN perspective, we have not yet fully reached level we had with VEND-S for project management
16. Lack of stability & turnover in the VEND-R team impacts Yara BAU/RUN effectivity more than before with VEND-S
17. We should retain the ramp up team for BAU at least for 6 months for easy transition to BAU.

PRISMA – PMO / Governance / Tooling / Documentation

Learnings

1. Not the best idea to perform PRISMA transformation and at the same time reshuffle all your IT organization
2. VEND-R's T&T team were slow to acknowledge / understand, the actual agreed Contract. Read the Contract & train on it.
3. Lack of direct contractual obligations between VEND-S & VEND-R resulted in risks & issues that could have been avoided if a contract or any other binding document existed. 1. Assumptions vs. reality 2. Expectations were wrongly set.
4. Immature, incomplete, or transitional/evolving ITIL, CMDB, Processes, &/or Tools introduce risk to a T&T project. Lack of CMDB control was a high risk which added complexity & stress towards the T&T and Run handover
5. Documentation: Make sure docs don't go directly from vendor to vendor but goes through the Yara SME first. Review and approve the documents and then let the transition vendor build upon that existing documentation with the new set up , in that way you can compare what has been documented in the new set up and make sure there are no gaps.
6. Establish a Multi-Vendor review point / walkthrough of As-Is documentation to facilitate new Supplier KT
7. Although Risk & Issue management was inherent to the project and regular meetings occurred, there was a certain lack of responsibility & accountability in many of the risks and issues raised. There were also many risks that were neglected and not given the right amount of detail for their impact to be mitigated in a more effective way.
8. Org: Misalignment on the RACI with regards to what VEND-R could perform on the running infrastructure of VEND-S. New vendor assumed they would get complete full administrative rights to all the systems that were used for YARA, which was not possible. Being more detailed on the RACI could have helped to avoid these misunderstandings. Should have been an item in the RFP knowing what the new vendor could have access to.
9. Secure a more detailed Project Plan more early in the project. This was a critical pain point & it felt we were too much "reacting"
10. Due to the high volume of work happening, there were moments where key skill resources were not available from either organization (old & new IT vendor). This caused some cases of over utilization in some resources that could have been avoided if more resources with higher skills would have been assigned
11. Should have engaged SAP Migration / TQM service/review which may have avoided the crash
12. Should have established a better/more empowered framework for VEND-S to give feedback to VEND-R
13. Would have been beneficial to establish SWAT, Multi-Vendor, technical teams (in advance) to address issues
14. Keep more presence locally of your new provider during and for at least 6 months after transition
15. Generally, not enough time spent to build and in some cases re-build, the Vendor relationships

PRIMSA – AMS Transition (Application Management Services / AMS)



1. VEND-S provided good handover, shared docs, & recorded sessions
2. Good KT & mutual/professional cooperation between Vendors
3. Yara had significant inhouse AMS knowledge, which smoothed gaps

1. Project consumed ALL available resources, negative impacting other projects over an extended timeframe
2. Too much independent (silo'd) work, without proper integration understanding, comms, or focus
3. For "custom" applications, VEND-R was not adequately informed of criticality or complexity
4. VEND-R has much higher staff rotation, resulting in overall KT loss, as well lower Standards & taking of Responsibility

1. Time gap between completion of AMS handover & INFRA handover increased troubleshooting risks
2. Look out for dependance on Vendor's tools where rights may not be transferred or impact license costs
3. Customer must plan to act as broker between Vendors to bridge skill, language, culture, & location gaps
4. Specialized/niche systems/solutions require extra attention as Reduced VEND-R competency increases risks
5. Extra KT focus required on middleware, FTP's, OS Scripts, etc. as this knowledge is built from zero
6. Ensure Shadowing handover where the new team must watch the old team on how to solve issues (ideally, F2F)
7. Place more emphasis on the qualifications needed per team, than on the quantity of team members
8. Too low basis competence / knowledge in receiving team to be able to adequately onboard KT
9. Risk: With a long-standing, custom (stable) solution, VEND-S may also not have adequate KT to pass on
10. Risk: VEND-S will start to quickly lose/reallocate key resources; try to lock-in for T&T duration
11. You get what you pay for. Costs are down, but local (Yara IT workload) is up, so it's a diluted benefit

PRISMA – Integration & Middleware findings

Learnings

1. During migration, the 1-2-1 design mapping was not verified by the vendors through the official software vendors. We were dependent on internal competency which led to quite a few performance related issues on the middleware by retaining the same settings in the target infrastructure. The high-level & low-level designs were not vetted by the software vendors which could have probably resolved most of the performance issues
 - Secure that 3rd party support vendors of middleware products QA the set-up (both for technical settings, quality of design & licensing/usage risk reductions)
 - With a complex and global scope as a company like YARA we found it very tough to get a complete grip on the integrations especially while finding stakeholders on the 3rd Party side with whom the integrations are communicating and necessitate changes on their sides, such as related to IP & firewall issues
 - Do not underestimate the license complications especially with middleware systems; they are often based on CPU consumption and if there is no exchange of the licensing front it could leave a big gap and generally falls between the chairs leading to penalties as we found one in our experience with integrations.
2. Do a proper assessment of each integration & confirm if it's right time to transform/change from sunseting products vs. simply "lift-and-shift" as is. Doing too much at once increases risk even if it seems more efficient; a delicate balance to be struck.
 - Due to historical evolution of many interfaces/integrations spanning old & new technologies across multiple platforms & systems, we lacked a single CMDB/Source of truth which led to both issues during KT, as well in both cutover, and troubleshooting.
 - Sort this out well in advance of T&T or risk disruptions &/or possible outages; we had both
3. For any integrations, FTP / SFTP servers play a major role & it's recommended to test all interfaces using this platform well in advance with the test setup of the 3rd Party vendors to ensure that interfaces are working with good performance & quality.
4. Integrations should take a parallel stream with detailed planning & implementation in the target infrastructure
 - Based on our learnings, the detailed cutover plan should be run through with all the stakeholders
 - integrations can cause big surprises leading to need for late "NO-GO" decision after a migration has completed
 - Hence, we strongly recommend to take proper assessment and planning on integrations alone.

PRISMA – Infrastructure Transition & Migration (Managed Hosting Services / MHS)



1. Yara established detailed Future Service Estate landscape & tracked it with military fashion (VEND-R should have done this)
2. Generally, a well-managed Hosting handover considering the number of servers, applications, & parties involved.
3. Most all Non-SAP migrations were well handled with a relatively small Yara support team
4. Competent SAP team was made available by VEND-R for the migration.

1. Extreme focus on Exit from VEND-S INFRA resulted in last min. scramble & not enough attn. spent on Target environments
2. Yara was a bit inconsistent in our intent; was it 'lift-and-shift' or was it "transform" (Business Impact Analysis, security zones etc.)
3. Solution implications were not well enough understood, including use of copied or default settings used, without optimization
4. Performance risks not adequately modeled in QA phase for which we paid a painful toll
5. Not all expertise proposed during RFP was (in reality) made available during Execution & troubleshooting situations; a large GAP
6. Local servers & NetBackup transfers: VEND-R lacked option to virtualize & non-transferrable tools / licenses created issues
7. VEND-R significantly underestimated efforts required from VEND-S creating delay & extra stress & costs
8. Multivendor environment makes it hard to find right tech people; need predefined SWAT teams with names
9. SAP Migration target environment should have been assessed in more detail for possible impacts (Oracle licenses & DB settings)
10. For SAP Infrastructure , instead of AS-IS ("lift-and-shift") mindset we should have gone one step further; missed opportunity
11. Detailed, final Network Cutover plan should have been much more exhaustive & this hurt us
12. Management of key risks (3rd party licenses) was not adequately done

1. Licensing assessment should have been more exhaustive (avoiding painful Oracle & WebMethods "discussions")
2. C1.Unix to Linux #1 problem.. Parameters are not the same
3. C3.SAP Upgrade service (Enterprise support) Quality Assurance / check
4. C4.We didn't demand a LL design, we realised upon the Vendor & that they would organize the T&T with proper KT, etc.
5. C5.DB Vendor side (Oracle or SQL, etc.) expertise on call.. SAP as well
6. Network cutover planning was not as detailed as it should have been causing many unplanned issues/disruptions.
7. **Lack of stress/performance testing resulted in post Go-Live Core SAP ERP crash & outage for several days**

PRISMA – A nightmare scenario: Core Production system down

- On the weekend of 22-24 February 2019, we migrated YSAP (one of Yara's critical & core SAP ECC ERP Production systems), from the incumbent data center into the new vendor's infrastructure/environment, following successful testing and a unanimous "Go" decision.

Upon receiving full user loading on Monday morning, several critical applications experienced major performance issues resulting ultimately in several days effective shutdown. This led to delayed payment, stalled customer ordering processes, failure to load newsworthy backup of trucks across the globe

Subsequent learnings & Recommendations:

- While the migration was planned, the consideration to low-level design on adapting OS & Database parameter values from a different OS + database to a new OS + database was not considered in detail. This led to keeping the same parameters which were not sufficiently tuned to take the full user & system load after go-live in the target infrastructure.
- This led to major disruptions & all the systems performance indicators spiked leading to connection loss with all other SAP systems, non-SAP systems, middleware, printing & interfaces, and many other functions were disrupted to varying degrees which were directly or indirectly impacted by the non-availability of the central core ERP system.
 - *In technical terms, the buffer cache was undersized causing significant additional read I/O, Database optimizers were not run prior to the migration, Transparent Huge Pages (SAP Recommendation) – not disabled, few resource seeking custom programs went rampant after the go-live occupying most of the memory, ARFCSTATE table has grown exponentially which took most of the system resources after restart.*
- The SAP software, OS, DB, & middleware vendors were not adequately consulted in advance to vet the full migration design which probably could have avoided the crisis to large extent. Thus, it's very highly recommended to involve them & not rely exclusively upon the new vendors' internal knowledge.
- Its advisable to have additional infrastructure components in reserve & not take the risk of operating with a minimum setup, eg. build some spare application servers in advance which can be used in an emergency (on short notice) to boost up the system power with extra CPU & memory capacity after go-live
- Have a fully configured monitoring system (such as Solution Manager for SAP systems) in place to monitor the performance, database, IO statistics, user load, application in errors, job failures, etc. in real-time rather than waiting for the users to report issues after go-live. Have knowledgeable persons following closely those statistics from all discipline areas
- Prepare for a Crisis management team in advance with resolution time and required resources to attend to major issues rather than scramble at the last minute which will save valuable time to make decisions



Q&A

