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Manageability and Operability in the Business Services Fabric

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***Abstract*— The focus of manageability and operability concerns for long has been the Information Technology (IT) infrastructure and capabilities. Over the years many proposals have been made for improving IT Services Management. In the new cloud environment, the users' ability to manage service performance is limited at best; the situation would get worse when enterprises require a seamless integration of public and private clouds with their and their partners' IT infrastructures. This paper proposes to focus attention on the manageability and operability of business services because in the end their performance affects business outcomes.**

***Index Terms*—manageability, operability, clouds, services**

I. Introduction

In the days before the advent of computers, an enterprise designed its business processes to accomplish changed business objectives. The operations of these business processes was performed by its people organized in some structure, and were enabled by the supporting infrastructure (facilities, mail room – including exchanges of process produced artifacts to the next organization in the process, filing systems, office equipment, etc.). As automation crept in, the computing equipment became part of the enterprise infrastructure. Over the next 50 years, the focus of enterprises shifted to its computing strategy. Today, businesses are again trying to refocus on business processes and business services.

Goyal [1] presents the concept of a business service fabric (BSF) – a model for heterogeneous virtualization and abstraction of services, applications, policies, capabilities, resources, infrastructure and, even, people. The paper also presented the concept of logical and virtual partitioning of the business service fabric – distributed virtual islands of business service sub-fabrics (VBSF). A BSF may span company, geographical, and technological boundaries, public and private clouds, and corporate data centers. Bridges between VBSFs, provided by sub-fabric mediator services manage and control inter sub-fabric interaction, manage protocols, including protocol conversions, and monitor and manage the underlying sub-fabrics [1]. In a business sense, the sub-fabric mediator services manage the interaction between, say, partner environments.

The services centered world is a complex systems of systems that must work together to deliver services. A "Service" is an integrated "stack" of services, such as applications, database services, middleware services, directory services, operating system services, and network services. Each system in the stack has a realization, specific behavior and state that is governed by their (and their constituent components/elements) attributes, configuration settings, users, and permissions.

In this view, the BSF and the VBSFs are a virtual aggregation of business services, from diverse sources, in a networked services environment, that permits consistent usage, manageability and operability. In a VBSF diverse, discrete set of services work together to perform some tasks while communicating over business services protocol stacks.

Businesses require:

- Efficient business processes that make the organization leaner and meaner
- Change management process to ensure that the key business performance is maximized at the least possible cost and TCO
- Improve service levels
- Reduce service failure rates, improve the speed of recovery in the event of failure, and reduce the cost of doing so.

The delivery of these capabilities requires operational excellence – manageability and operability of the services and supporting environment, and that is the focus of this paper. The paper first introduces certain aspects of business services as they have relevance to their manageability and operability, then defines the scope of manageability and operability, and then discusses how the concepts of a BSF and VBSF support services manageability and operability.

II. Basic Concepts

A. Business Services Framework

The BSF and VBSF allow for better manageability and operability of the world of networked business services. In the model [1], a user – an end-user of a service, a service developer, or an administrator – operates in their permitted BSF; the user BSF is configured to include the necessary VBSFs.

The BSF hides the characteristics of the underlying resources from the way in which other services systems, applications, or end-users interact with those resources. Each user has an isolated, fully functional services environment based on their rights and their role. Users, if they have the permission, can create new services or assemble a new service in their appropriate VBSF, by creating collaborations among other services whose capabilities may be restricted based on user permissions and user connectivity characteristics. The user might only have these "create" capabilities in a sub-set of VBSFs, including none; the user needs "use" capabilities in the VBSFs that constitute the user's BSF. The user's ability to make these new services available to other users is highly controlled and managed – for example, a policy that requires certification of the new services manageability and operability. The benefits of BSF include:

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- The ability to provide a unique environment for each and every user
- Each of these environments can be completely customized with different services, Manageability and Operability capabilities
- Users can be granted more control of only sub-segments of their BSF so they can mesh with other compatible and approved services
- Environments are available at anytime, from anywhere – access and capabilities may be restricted based on noisiness of the environment
- Enhance the overall business effectiveness of an extended enterprise.

B. Just Needed Service Capabilities (JNS)

One common method to virtualize the computing environment splits the Operating System into two discrete systems – a hypervisor that manages the virtual machine (a virtualization of the physical infrastructure that provides hardware-based services) and an application delivery system (also referred to as service delivery platform) for managing the application and providing needed services. In this, the application binds with just enough of the needed operating system services ("JeOS" – Just enough Operating System).

In the model presented in [1], business services bind or utilize just the needed services (JNS) from BPMS, database systems, middleware frameworks, etc. The business services also utilize business manageability and operability services such as fault, configuration, accounting, performance and security management.

C. Services, Agents and Processes

A process is a coordinated set of activities that collaborate to deliver some specified output (product, value, etc.). Processes are composed of other processes; processes interact and collaborate with other process; end-to-end (e2e) process performance can be monitored, measured and analyzed. Business process measures (key performance indicators – KPI) help verify that business process actions are being performed (monitoring) and expected results (targets) are being achieved (analytics); the monitors are also services and can be internal or external. Action, preferably policy-driven and automated, is taken when there is a gap between expected and achieved results.

In the extended services model [1], processes, resources (computing, network and data), messages, people, and all other "things" are "services" (to differentiate between the other widespread use of services, we may use the term business services). A service is composed of other services and interacts with some other set of services through messages. The implementation of a business process/application utilizes a subset of the available services subject to policy restrictions. Sub-fabrics restrict the possible interactions, the type of resources, their location, manageability and operability options. Mobility, thus, can be restricted to well-specified service implementations (agents), middleware, network segments, client devices, compute servers and data servers.

An agent realizes or implements a service; a service can have one or more realizations. A service can be realized by multiple agents where the agents have certain capabilities. For example, a Service S0 realized by agents A01 and A02, where A01 guarantees a better performance than A02. Or, A01 is an implementation that conforms to laws of country X whereas A02 conforms to laws in a set of countries. The choice of provider agent depends on requestor agent capabilities, performance, management policies, and cost considerations; policies specify required (of the requestor agent) and supported capabilities, like manageability and operability.

Policies constrain the behavior and utilization of resources, and apply to (or govern) Agents. Policies can be classified as Governance or Management policies. A governance policy imposes an obligation on the agent – a task or action that must be performed; for example, logging of all messages and usage, or the validation of the "state" at the end of a task. We differentiate between two types of management policies – capabilities and permissions. The latter permissions are about rights to perform some task, while the former is about the capability to monitor, manage faults, configuration, capacity, performance etc.

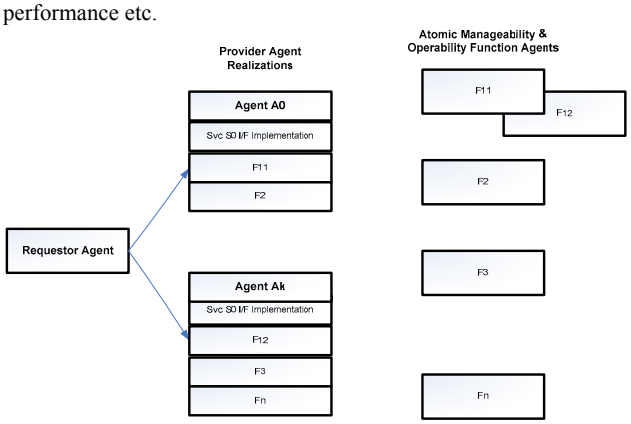

Figure 1. Agent Composition with internal Manageability and Operability Services

Services realized by external agents or incorporated within the managed service enforce policies. An agent A0 realizing a service S0, thus, may consist of a number of management service agents that manage the set of capabilities of the agent A0 (Figure 1) and a set of external management service agents (Figure 2) within the same layer or a higher layer (was unable to capture this aspect neatly in a model). This is very important, as only certain policies are internally manageable while others may require external coordination and management; the external management agents also enforce policies, for example, in a legacy application. Another way of saying is that a management service manages agents/services at its layer and a "consolidation/correlation" from the lower layers.

Requestor and provider services (and agents) impose constraints on each other. For example, for the discovery and utilization of the provider service description and interfaces, the requestor service may need to posses the necessary rights. The VBSFs further restrict utilization of services within their scope.

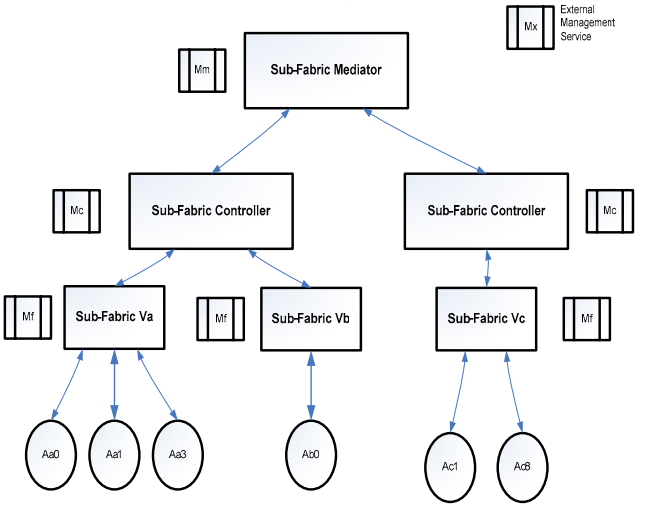

Figure 2. External Manageability & Operability Services, including at Sub-Fabrics.

D. Policy-driven Manageability an Operability

At least 80% of all data are written once, read many times (WORM). Examples of such data include business documents, medical records, email, news, audio, video, etc. The major concern for these items then becomes their security and availability, including compliance with retention policies. It can be argued that the portion of the remaining data that requires versioning, that is, the older version cannot be overwritten, many times due to regulatory compliance issues, is also WORM data. This service usage analysis of data enables performance improvements by (a) dedicating storage systems to WORM data, and (b) provisioning an asynchronous network connection to these WORM data stores – higher bandwidth dedicated to the connection from the store to the requesting server.

For the data that can be overwritten by multiple users, IT has created elaborate schemes for transaction control, including concurrency control mechanisms. Most of these mechanisms do not view the data from a business perspective. From a totally business perspective, the domain for its use and the universe of users of this type of data is likely to be very limited.

For example, a bank account. The policies that govern the operation of a bank account would include:

1. The account owner to operate the account – withdraw, deposit, balance – on presenting valid credentials, say, at an ATM
2. The bank teller to operate the account – withdraw, deposit, balance – only on the account owner presenting valid credentials
3. The banking system, say, the check processing system (let us include previously authorized regular electronic funds transfer), to withdraw and deposit monies based on the processing of a valid business document – a check.

The account owner may reasonably expect that it would receive efficient service – priority, say, over operation #3 above. In the case where there is only one account owner and both operations #1 and #2 occur "concurrently", then #2 has to be a fraudulent activity. Depending upon the risks, the bank policy may specify "concurrently" to include, say, operations conducted 5 miles apart within 5 minutes.

The major point of this discussion, however, is that it is possible to create policy driven business services manageability and operability. In the above example, there are 3 types of uses with a priority processing hierarchy.

III. Business Services Management

Service management, traditionally, refers to the IT infrastructure. In the business services fabric environment it is more important to consider service management from a customer and, hence, a business view. In this paper, Business Service Management (BSM) describes the management processes, systems and best practices needed to build a smarter business by efficiently delivering business services. BSM is the collection of policy-driven processes to keep services running in good condition (e.g., deployment, configuration, upgrades, tuning, backup, failure recovery). BSM monitors the health of the services and executed processes for their manageability and operability. BSM involves mapping, measuring and managing of services.

Communication patterns between components of a business service play a vital role in determining end-to-end non-functional properties, such as, availability, performance, etc. certain components and some of the tasks that they perform are usually critical to the overall non-functional properties. VBSF is a mechanism to optimize the interactions with these critical components. The following capabilities/activities further help in the manageability and operability of services and VBSF enhances their effectiveness, scope of impact or implementability:

- Stateless services, like application servers, require little configuration, can be scaled through mere replication, and are reboot-friendly.
- Exposure of service management capabilities via interface mechanisms: fault, alarms, configuration, inspection, monitoring, and security.
- Virtual Resources, with integrated self-management, that allow for the integrated and flexible usage of heterogeneous and assemblage of these virtual resources.
- Virtual assurable resources, which do not necessarily correspond to administrative, topological or geographical domains and which would take into account concerns such as confidentiality, availability, integrity, and safety; are used to enable collaborative exchange information in pursuit of shared interests, services or business processes.
- Provide light-weight virtual channels that enable interaction between services.
- Provide mechanisms for the dynamic deployment of new management functionality without interrupting running services.
- Provide mechanisms for dynamic deployment of measuring and monitoring probes for service behaviors. Use monitoring services to support the self-management functionality.
- Provide mechanisms for allocation and negotiation of additional resources.
- Increase the level of self-awareness, self-knowledge, self-assessment and self-management capabilities for all services, and resources.
- Increase the level of resource management, including discovery, configuration, deployment, utilization, control and maintenance.
- Provide policy and service-driven orchestration and integration of management functions.

1) Map Business Services

Mapping starts at the business service and works down the food chain to the constituent and invoked services, creating a model that shows how the service works and how its pieces fit together. The "services map" captures this mapping of the service through the underlying resources, and the service's dependencies and interactions with "other services" and how they factor in the delivery of the business service.

The sub-fabric controller and sub-fabric mediator services help in the auto discovery of services and the services through their management interface provide mapping to the underlying resources.

The critical "other services" and measures representative of service performance are identified; for example, the number of requests waiting to be processed – this may affect the overall business process performance.

2) Measure the Business Service KPI, QoS

Monitor the service performance at various levels. In addition to the internal data that a service provides, the VBSF controllers/mediators monitor changes in, say, response time. The monitoring data from the controllers/mediators is at the VBSF level and is related to the underlying resources; for example, the performance of the messaging service would impact the VBSF layer messages, and network performance issues would impact inter-VBSF interactions.

Monitoring services, constituents of or external to the monitored service, measure the quality of the user experience and monitor the

performance of the service and its constituents – a user may be the requestor service.. It is important to monitor business service performance, and not just the underlying, say, IT resources performance. For example, all IT resources may be working perfectly and the service may be performing as intended but if the in-queue of messages is growing then the business service cannot be performing as its users expect. Expected performance for the KPIs is established through simulation and testing and user tolerance (where users maybe other services).

3) Manage the Business Service

Managing the business service requires a broad set of discovery, monitoring, diagnostics, reporting, analysis and policy-driven resolution services, enabling the management of services. These management services:

- Detect, analyze and repair performance issues
- Maintain high uptime, performance and responsiveness standards
- Provide key performance metrics for proactive correction
- Provide information visibility to other services and tools for any necessary corrective actions.

B. Services Lifecycle Management (SLM)

Lifetime management processes manage the lifetime of services and their underlying resource(s). SLM is about the management and control of services throughout their lifecycle. Effective SLM policies:

1. Control the creation and composition of services and their realizing agents during their birth phase:
   a. Manage who can deploy services and where.
   b. Map the services and agents to their underlying realizations via auto discovery.
2. Monitor and control services/agents during their living phase:
   a. Monitor and control performance, faults, risks, etc.
   b. Enforce Policies.
   c. Enforce mobility policy ensuring that services/agents only run within specific permitted VBSFs.
3. Manage the services during their dying phase:
   a. Enforce policy compliance.
   b. Ensure logging.
   c. Free up resources.

IV. Business Services Fabric Manageability and Operability

A. Manageability and Operability

Operational Excellence achieved thorough consistent management and operations of the business, compliance, operations and security. The BSF supports a business policy-driven process approach to manageability and operability of the services, and their underlying realizations; policies specified at the BSF and VBSF levels. This approach creates a proactive enterprise-wide environment that continuously monitors and manages risk, detects emerging problems, responds, reconciles, reports, and measures results in real-time.

The objectives of manageability and operability are to gain a competitive advantage through operational excellence. Policies-based manageability and operability achieved through:

- Management Services embedded with controls to manage and mitigate risks to an acceptable level. Regulatory compliance and security concerns are both risks.
- Management Services for scalable and flexible solutions, on-demand business change, service availability, required performance, and financials (ROI and TCO).

E2E manageability and operability is enhanced and simplified when services bund or use just the needed set of resources. Changes in workload or performance can then automatically trigger processes for provisioning of additional resources or for freeing up resources.

1) Manageability

Manageability is the composite result of a number of different facets, including, availability, scalability, performance optimization, reliability, risk management, business continuity and change management. It is apparent that many of these aspects are in turn dependent upon each other, and in some cases negatively affect other aspects of manageability. For example, risk management adversely affects performance. The more frequently a system needs to be managed, the poorer its manageability. The longer each management step takes, the poorer the manageability. The more steps involved in each management action, the poorer the manageability.

Business services adapt to an environment through composition and/or by interacting with the appropriate services. The service policies specify availability & scalability, performance optimization, monitoring and security requirements. Services being stateless achieve seamless incremental scalability and high availability through service replication. The services provide visibility into their performance, in particular, along the key performance indicators (KPI) through a combination of constituent and external monitoring services.

VBSFs provide a mechanism for performance optimization of business services independent of user location and access. For example, a user accessing the application from a branch location across a congested high-latency WAN, experiences acceptable performance. Latency optimization is a requirement for enterprise business services owing to the global user base.

The term business services continuity planning (BSCP) differentiates from the more IT-centric Business Continuity Planning (BCP) and Disaster Recovery (DR) terms. BSCP specifies business service availability, reliability, and recovery requirements. It should be noted that services being stateless can be recovered faster than systems which require the complete state of the system to be restored and the restart to happen from the point of recoverable failure (usually, some checkpoint). The services composed with JNS can be recovered faster as their image size is considerably smaller than the traditional virtualized application image (may consist of OS, DBMS, etc.).

A service becomes manageable when it exposes a set of management operations that support management capabilities; these operations may only be exposed to services with the necessary permissions. The management operations provide for monitoring, controlling and reporting functions, in addition to policy management capabilities. Services (agents) can raise alarms based on policy infringements, say, when the In-queue length has exceeded some threshold. Information may also be provided in response to a manageability query on request and response counts, begin and end timers, etc.

The services interface specifies the supported management capabilities to monitor, diagnose and manage service performance. In addition, the controller and mediator services provide performance capabilities at the VBSF-level, i.e., sub-process levels. For example, by analyzing and aggregating monitoring data within the services under their control, the controller/mediator services can perform inter-service resolution. The controllers and mediators also aggregate and abstract fault data – this can be useful, say, when many of the services within a VBSF control are all raising similar faults, thus, pointing to a problem not under individual service control.

Although the provision of management capabilities enables a service to become manageable, the extent and degree of permissible management are defined in management policies that are associated with the service and the VBSF environment that the service operates in. Management policies therefore are used to define the obligations for, and permissions to, managing the service.

Manageability and operability of services is simplified when services operate in well-defined and managed environments. The VBSF (sub-fabric) mechanism provides this well-partitioned and governed logical resource pool, and more. A VBSF circumscribes, to a certain extent, the permitted behaviors. In a VBSF, for example, the services (agents) may be restricted to certain possible interactions, the type of resources, their location, manageability and operability options. The interaction between services in different VBSFs is also well-defined and managed by the controller and mediator services [1].

The function of the sub-fabric controller service is to:

- Manage interactions within the services of a sub-fabric (intra-VBSF).
- Restrict certain interactions to services within the VBSF scope.
- Provide a level of scope visibility (for example, names, messages, broadcast messages).
- Control and monitor service mobility.
- Manage aggregation/filtering of certain type of faults and alerts, and manage the interaction with mediator services.

The function of the sub-fabric mediator services is to:

- Manage and control inter-VBSF interaction.
- Monitor and manage the underlying VBSFs.
- Manage protocols, including protocol conversion.

Management Ecosystem: supports the set of processes and activities necessary to deliver services and operate them to meet some of the service objectives.

In a management ecosystem, there is at least one agent acting as the manager and at least another agent acting as the managed agent. The manager requests either information or the performance of some action. The manager agent facilitates the performance of the request by interacting with the managed agent via a link between the manager and the managed agents. In the management ecosystem, an agent can assume the manager role, the agent role or both. For example, a monitoring agent is in the 'manager' role when requesting information from a managed agent in the same VSBN, but is in the 'agent' role when asked by a mediator to provide overall status of the VBSF's health.

Adapter agents: allow business services to use common interfaces to address other services regardless of their native interfaces. Adapter agents typically allow request for operational access to single resources (the common interfaces is to multiple resources but the access is for a resource at a time). Adapter agents do not typically support generic functions for all functions performed using the native protocols; generic functions can be supported for data access.

Group agents: simplify the way a management agent accesses a group of managed agents for requests (pre-defined) sequences of operations to be performed on some or all managed agents of the group. These conceptual group agents permit generic functions to be defined that involve the same or similar operations in some or all of the agents of the group.

Orchestration agents: allow business services to interact with agents realizing elements of a service and make it possible to synchronize many different events/operations that might apply. Orchestration agents enable the performance of complex operations on a dynamic and diverse grouping of agents and control behavioral changes during operation.

2) Change Management

Change management is critical to manageability – uncontrolled changes can have a significant impact on performance, reliability and security, among others. Significant performance gains are realized when controls are implemented that automatically detect changes, and reconcile the changes with authorizations to ensure no undocumented or unauthorized changes.

A business service change may result in change throughout the entire service stack. The "service stack" contains an integrated set of systems including process middleware, process execution engine, applications, databases, middleware, directory services, operating systems and networks. Each system in the stack has a specific behavior and state determined by a multitude of detailed elements including file systems, configuration settings, users, and permissions.

Someone other than the person (or technology) making the change must approve and record the change. This segregation of duties prevents fraudulent change recording and mistakes. Finally, an audit trail describing all changes, including when they were made, and by whom, must be maintained.

- Permit only authorized changes.
- Investigate all unauthorized changes.
- Change Detection, preferably automatic.
- Change Reconciliation, preferably automatic.
- Audit all changes.

3) Security

Security is very important. When users visit an enterprise (brick-mortar or online), they have an expectation of their personal and their property's security via both visible and not-so-visible security mechanisms; is a prominent display of a trusted site sign sufficient? They also expect to be served promptly, courteously (how many web sites are courteous?) and efficiently. They expect that their need for service (item purchase or some other activity) to be met, they expect service availability, adequate amount of information and help, convenience, ease of access and ease of use.

Business services may require point-to-point and/or end-to-end security mechanisms, depending upon the degree of threat or risk. Traditional, connection-oriented, point-to-point security mechanisms may not meet the end-to-end security requirements of services. However, security is a balance of assessed risk and cost of countermeasures. Depending on implementers risk tolerance, point-to-point transport level security can provide enough security countermeasures.

Business service implementations require e2e security mechanisms depending upon factors such as the degree of threat or risk. Risk to services is not only external but also internal: sabotage, theft, etc. Security, risk mitigation and management require a "defense in depth" approach where layers of controls and visibility into unauthorized attempts manage risk/threats. Environment and scope specific policy-driven and risk-based controls and visibility, and active policy management ensures compliance.

BSF/VBSF provide a virtual environment analogous to a physically separated and protected instance (of the service and its resources). End-to-end security is achieved through isolation at several levels (user, services to resources), and through a federation of several VBSFs if necessary. The VBSFs provide layers of security and the capability to isolate compromised services.

4) Service Reliability

Service provider agents and/service requester agents, where the different agents may be owned by different people, composed from other agents and subject to different policies and management, may

not be able to provide complete service reliability. Agent reliability involves the reliable and predictable behavior of the requester and provider agents, and the interactions between agents.

In a VBSF where reliability is important only interactions between "certified" or known agents would be permissible. Reliability can also be enhanced by managing the conversations/interactions between agents and provide visibility to all the parties involved that the interactions between them are progressing satisfactorily. In the event of failure, the failure is identified to the parties and the interactions are cancelled, and the effect of any completed actions rolled back or compensated for – again keeping the parties informed of the actions being taken and their progress.

5) Operability

"Operability" is the ability to operate the system while it is performing its intended function as intended during its "up time". It includes Reliability, Maintainability, Supportability, Flexibility, Safety, Operating Cost, and Usability; "usability plus efficiency of resources." Reliability is a composite of availability and its ability to recover quickly to full-operational state quickly. A reliable service rarely fails, and when it fails is still partially available but more importantly can quickly return to full operation.

Supportability is the ability to operate the system and adapt to changing demands, for example, by the ease of its scalability. Maintainability is the ability to quickly make changes to the service and keep the unavailability of the service to the bare minimum. Operability determines costs that include the costs for support, maintenance, training, technical publications, spares, support equipment and some facilities.

A VBSF reduces the cost and complexity associated with managing the service lifecycle from creating the service, managing its operations and connections, and then managing the services discontinuation. The following shows a subset of the steps in the service creation process that endows the service with operability capabilities.

a) Create Services

Services can be created using any one of many service development tools by completely creating a new service or by adapting existing services or by encapsulating an existing application in a service.

During the service creation process, the non-functional capabilities would also be created for the service. The actual realization of these non-functional properties may be provided by incorporating existing management agents. The Policies that govern the service will also be defined and policy management agents would also be incorporated.

b) Register Service

Register a service on a VBSF – the user must have the rights to do so. The registration process would entail the discovery of the description, interface, capabilities, etc. It would also require specifying the management capabilities and interfaces. The visibility of the service and the scope of its interactions may initially be restricted to the specific VBSF.

Services register to be visible within some defined network of VBSFs depending on the service creators and service credentials (for example, certification of manageability and operability).

The manageability and operability capabilities of the service (automatically) specify the interaction patterns between the service and external management agents local to the VBSF.

c) Service Operation

A service in a VBSF can interact with a service in another VBSF, say, in a partners' data center, utilizing the mediator service. The mediator service manages authentication, the interaction and also provides protocol conversion, for example encryption, and policy management.

V. CONCLUSION

The International telecommunication Union developed one of the earliest service management models [2, 3]; while the scope of the model was for telecommunication systems, other service management areas, including IT, adopted the concepts. IT Service Management (ITSM) has long been the focus of organizations and there is an increase in the use of the ITIL guidelines [4, 5] on ITSM to make IT organizations more flexible, cost-effective and customer service-oriented.

This paper, instead, focused on Business Services Management (BSM) – the manageability and operability of business services and business operational excellence. The focus of organizations needs to be on business strategy, business agility, customer focused and this requires a complete mindset change from thinking about what IT can do to what the business must do. In today's on-demand 7x24 business, the old days of isolated discrete business processes has given way to integrated and highly inter-dependent business processes. This requires that businesses:

- Replace isolated business processes with integrated customer service delivery focused agile, scalable and streamlined processes.
- Eradicate business process silos.
- Measure, Measure and Measure.
- Proactively strive to continually improve processes using benchmarks, measurement and innovation.
- Proactively manage business service to achieve operational excellence and the defined business value.

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