

**OPTIMIZED SERVICE REQUESTS  
FLOW IN A GLOBAL  
SERVICE ORGANIZATION**

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Dedicated to my family



# Introduction

Commercial organizations are required to provide services for products sold in foreign countries. Commercial organizations have to set up globally distributed service organization to serve the customers based on different business needs. Portal acts like a medium for knowledge exchange and for requesting services between commercial organization and the customers. Area of service is added to the service request and is used to route the service request to service staff. In case of a service related to a complex product, the area of services may expand in hundreds of types. Inexperienced service requestors may send service requests by assigning them incorrect area of service. This can lead to extra financial cost for both the customer and commercial organization selling the product. This publication describes an approach which uses the past history of the activities of the service requester for determining the appropriate area of service. The service request is routed to the service staff that is capable of handling the service request.

# Chapter 1

## Need for global service organization

In the era of globalization, commercial organizations sell products to international customers in different countries (OECD, 1999; Scarlett & Koslow, 1999). Commercial organizations are generally required to provide maintenance services to the customer base during the lifecycle of sold product (Cohen & Whang, 1997; Kumar & Kumar, 2004; Markeset & Kumar, 2003; Tsang & Jardine, 1999). Commercial organizations setup service organization with or without collaboration of external parties (Herskett & Sasser, 1997; Poisant, 2001). A service organization may consist of a single centralized service organization or it may be a collection of multiple service organizations spread throughout different regions while acting like a virtual organization (Dossani & Kenney, 2004; Nachum & Aharoni, 2000; McLaughlin & Fitzsimmons, 1996; Tidsskrift 2004). A commercial organization decision to setup multiple organizations spread throughout different regions depends on the global business needs. The business needs which require setting up of multiple service organizations can be very diverse and may deal with different aspects such as:

### *Linguistic requirements of consumer market:*

Consumer behavior is affected by linguistic aspects (Zhang & Schmitt, 2003). A central service organization serving customers throughout the world may not have service staff which can communicate effectively with customers which are based in foreign countries and speak local languages. Hiring local service staff with multiple language capability may not be a cost effective

option. In this case, setting up service organization in the regions where local service staff can be hired at a reasonable cost is a good option.

***Cultural diversity of the consumer market:***

Different regions have their own culture of doing business dealings (Gomez-Mejia & Palich, 1997). Customers based in some regions are more comfortable in dealing with service staff which understand and practice their way of doing business very well.

***Service delivery requires frequent onsite visits:***

It is not always possible to serve the products remotely depending on the nature of product. In many occasions, providing service requires the visit by a service staff to the location where the sold product exists. In case of adopting a single global service organization, the cost of dispatching service staff to the location of the product may be too costly for both customer and the commercial organization. Urgent visits may involve international travel arrangements which may make it impossible to meet the deadline for completing the service as described in the service level agreements between the customer and the commercial organizations. In such scenario, it is common to have distributed service organizations in different regions which acts like a single virtual organization.

***Customers are based in different time zones:***

A single centralized service organization may not be able to serve customers based in different time zones due to the high cost of setting up 24 hours service organization using multiple shifts by the employees. It is sometimes more cost effective to setup a service organization which operates in the local time zone making it cheaper and easy to use the local resources.

***Requirement of better visibility in the local market:***

Setting up local service organization which employs local staff gives a better visibility to a commercial organization in the local markets, sometimes compensating the high cost of hiring local staff. Such local visibility also increases the chances of growing with the local market. Local visibility also helps increase the business transactions volume with the public sector. Local visibility is one of the main drivers for setting up local service organizations.

***Skill requirements:***

Sometimes, service delivery involves large set of technical and business skills. It may be difficult to acquire service staff with diverse set of skills in desired volume from a single region to be able to setup a single centralized service organization. In this case, the service organizations are set up in the locations where the skill is available at a reasonable cost.

All above different types of business needs may require a very complex global service organization consisting of multiple units that:

- Exists in different time zones
- Spread in different geographical locations
- Have service staff with specific language skills spread in different physical units
- Have staff with specific skills concentrated in specific service units.

However, any global organization having multiple service units spread throughout the globe, generally needs to make invisible the internal organizational complexity of the service organization to the external customers to make the customer feel easy about dealing with global organization. Efforts to make invisible the internal complexity of the service organization are generally targeted at different aspects of service delivery such as:



- Communications between the service requestor and service staff
- Execution of service request in form of service delivery
- Financial aspects of service execution
- Post processing such as collection of feedback

# Issues with technology supporting operations of global service organization

Computer systems play a central role in simplifying the interface between the service requestor and the service delivery organization (Agnihothri & Sivasubramaniam, 2002; Blumberg, 1999; Rust & Kannan, 2003; Ruyter & Wetzels, 2001). Computer applications are used at different stages of service delivery for different purposes such as;

- Applications are used for communications between the service requestor and the service staff.
- For a service delivery, which requires the transfer of knowledge or information between the service requestor and the service staff, applications are used which allows access to both parties for knowledge and information exchange.
- Applications are used for billing and invoicing for the delivered service.
- Applications are used for post processing of the service delivery such as collecting the feedback or complaint processing such as requests to redo the service delivery.

Portal is one of the modern computer applications, which can be used for all the above purposes (Gant & Gant, 2002; Hazra, 2002; Raghavan, 2002; Raol & Koong, 2003; Wimmer, 2002).

- Portal can be used as a communication means between the service requestors and the service staff.
- Portal can be used as an effective mean for dispensing knowledge among different parties (Firestone, 2002; Staab & Maedche, 2001; Tatnall, 2004).
- Portal can be used to exchange financial documents and checking the status of the financial deal.

- Portal can be used to purposes such as collection of the feedback from the customers.

Different portal products are available in market such as Enterprise Portal from SAP AG which can be used for all of the above purposes.

The first step of interaction between a service requestor and a service staff through a portal starts with a creation of a service request. The initial service request created by the service requestor contains information such as:

- Contact details of the service requestor
- Organizational details of the service requestor
- Description of service request
- Area of service request
- Importance of the service request for the service requestor
- Information about time period during which the service request needs to be completed

Let's assume the business scenario, in which the service requestor is requesting a service regarding a problem in the core corporate system such as an ERP. While creating the service request, the service requestor needs to decide a service area from a large number of already defined service areas. There may be very large number of service areas available for selection in the portal which is used for submitting the service request. In case of SAP ERP products, there are hundreds of areas of services from which user can select relevant service area. Service requestor selects an area of service request from the available collection of service requests and submits the service request. After submission, the service requests are processed in the way below:

- Each service area is assigned to a service request queue. Submitted service request are distributed to different queues according to the service area of the service request.
- Generally, service requests are processed based on the order of arrival. However, depending on the

criticality of the issue, a service request requiring urgent action may be placed at the front of the queue.

- Service staffs are assigned to process service request in different service areas. Here the term, service staff refers to a person who is employed by a global organization to perform service delivery based on the service requests. Each service staff is assigned a user profile. As soon as the service staff log on, the service requests in the assigned area of service are assigned to the service staff for delivering the service.

The service requestor can assign his service request to a wrong area of service due to several reasons.

The main reasons can be:

- Service requestor is unable to determine the accurate cause of the problem. For example, a user experiencing problems with system performance may not be able to determine the real cause. The real cause of the bad performance may be due to hardware bottleneck, operating system problem, some slow storage disks, problem with the database or congestion in the network. The service requestor may send his request to the database area while the network has not enough bandwidth to handle the network traffic.
- Service requestor does not have enough knowledge of the area for which he is creating the service request and thus is unable to assign correct area of service to the service request.
- There has been a changed in the hierarchal structure of service areas where old service areas have been merged into new service areas or some of the service areas have been removed. The service request creator may not be aware of the change in the hierarchical structure.
- Finding an appropriate service area matching the service request from hierarchical structure of services areas containing hundreds of entries can be difficult.
- The explanation provided with the service area hierarchical structure is difficult to comprehend or does not have sufficient details which an ordinary person could comprehend while selecting as an

appropriate area of service.

- New service areas have been added, about which the service requester is not aware and has sent service request with an old service area name.

Assigning an incorrect service area manually leads to different problems for the service requestors.

- A service request may stay in a service area queue where there is a long queue with long processing time or goes to a queue with a number of critical requests utilizing most of the available resources. The service request is assigned manually to the correct area only when the service staff processing the queue goes through the contents of the service request and finds out that the wrong service area has been assigned. This situation may lead to delay in the processing of the service request.
- A service request may be sent to a queue which is not handled 24 hours but is processed only during a limited time of a day. The service requester may feel frustrated finding ones service request not being processed (Houston & Bettencourt, 1999).
- A service request may be dispatched to a queue which is not directly related to the service area of the service request. For example for an oracle database tuning request, the service request may be sent to parent service area of database. The service request will be diverted only to the right sub service area when it reaches at the top of the service request queue and the service staff reassigns it to the right service area queue.

Assignment of the service request to the incorrect service area has many side affects:

- It might create delays in the service delivery for critical service requests, thus impacting negatively the business of the service requester.
- Service requester may feel unhappy seeing his service request being left in the service area queue without being processed.
- It may make difficult for the service requester to meet the requirements of the service level agreement between the service requesters company and the global organization providing services.

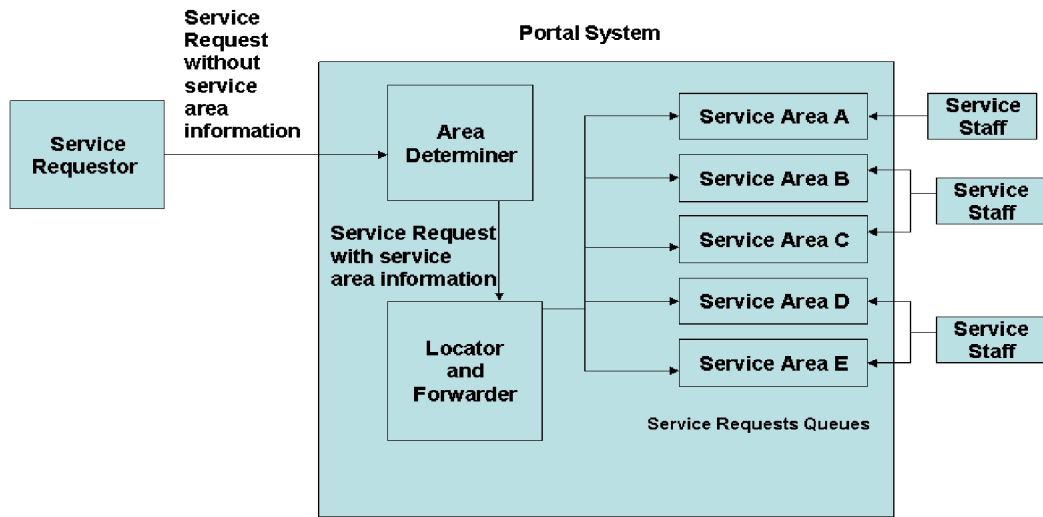
Therefore, there is a need to reduce the chances of service requests being assigned to the incorrect service area by the service requester causing inconvenience for both service requester and the service staff. This work describes architecture for automating the flow of service requests to the service staff utilizing the past history of activities between the service requester and the service staff. It reduces chances of service request being sent to wrong service area. Next chapter describes the architecture of the system used in optimizing flow of service requests. It also explains the workflow of the messages in the globally distributed service organization.

# Chapter 3

## Portal architecture

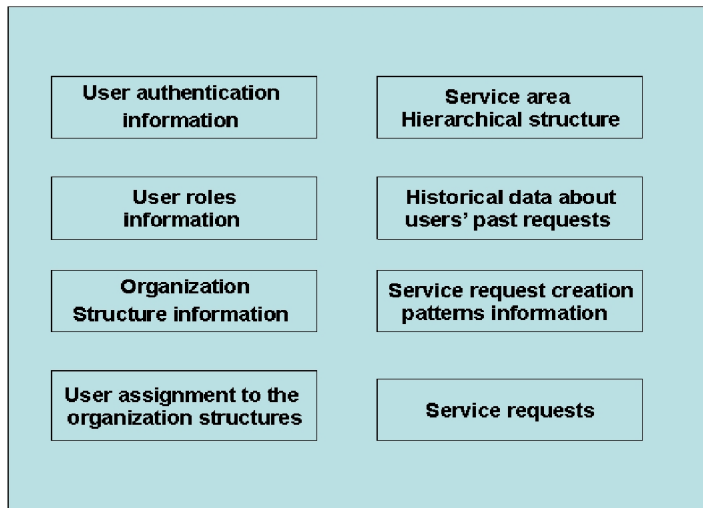
Figure 1 show the architecture of the portal system which can be used for automatic routing of the service requests to the service in case of a globally distributed service organization. Service Area Determiner decides which area of service to assign to the service request based on the history of the service requests from the user in past. Service Area Determiner may add calculated Area of Service in addition to the service area manually assigned by the service requester. The system may use rules to determine which area of service to use in routing the service request when both types of areas of service are available. Forwarder and locator first forward the service request to an appropriate queue. Then it locates the service staff that can deliver the service as requested considering the time zone, distance, cultural and linguistic requirements of the service creator. The service staff is selected using the shift schedules of each service unit.

Figure 2 illustrates different types of information which can be used to implement the architecture described in Figure 1.



**Figure 1: Architecture of portal system**





**Figure 2: Information modal of Portal's database**

Let's describes in details of the information modal illustrated in Figure 2.

### ***User Authentication and assigned roles***

This software component stores the information about the users which are allowed to use the portal. It contains user ids and passwords for all the service requester and the service staffs. All the users are assigned user profiles which describe what functionality each user can use in the portal. For example, the service requesters are allowed to create a service request, see the status of their service request and see the contents of the delivered service. The service staff is allowed to respond to service requests in their assigned service areas.

Below are the main sets of information used by the user authentication component.

**User Identification Information:** This information may include basic user identification details such as his full name, user id, user password and the authentication certificates.

**Roles Definitions:** This information may include the different types of roles and which functions they are allowed to use in the portal. For example, the portal may have two types of roles: one role defining the functionalities that a service request creator can use and the other role which defines what functions in the portal the service staff can use.

**Assigned Roles:** This information may describe which user is assigned to which user role. User Ids belonging to the service requesters are assigned the role of the service request creator and the user ids belonging to service staff are assigned to the role of the service staff.

**Languages spoken:** This information describes the language capability of the users and can be used for matching the service requester and the service staff which speaks the same language in case the service requestors wants service delivery in the same language as him/her.

**Geographical Location:** This information decides which user is based to which geographical locations. The information is useful for finding a service staff according to the time zone of the service

requestor.

### ***User organizational assignment***

This software module creates the hierarchical organizational structures, within the commercial organization which have multiple service units spread in different time zone and region. Different multiple service units and the service staff that belongs to them are defined using this information.

The service units and their hierarchy are defined using the following type of information.

**Organization Identification and hierarchy:** This information describes the identification of the service units and may include information such as the name of the service unit and a unique id. It also contains information about the period the service unit is active using information such as organization start and organization end date. The validity date allows planning future service units or keeping record of units that were active in past. It may also contain information about the hierarch structure among the service organization. Such as which service unit is reporting to which other service unit. It also contains information about the geographical locations of the service units and the time zones in which they operate.

**User assignments to the organization units:** This information contains information how staff are assigned to the different service units. It maps the service staff to the specific service unit and the working hour in which normally each service staff works.

### ***Hierarchical structure of the service areas***

This information contains identification and description of each service area and the hierarchical relationship each service area has in relation to other service areas. A parent service area may contain many child service areas. Such as a service area Database may contain sub services area each reserved

for different database vendor such as Oracle, SQL Server, Informix and UDB. It may also contain information about how to acquire the detailed information about what the problems covered by this service area. The information is frequently changed due to the addition, deletion and update of the service areas.

***Historical data about the service requests from specific service requester***

This area includes the history of service areas for activities of each service requester in past. This information is used to assign automatically the service request to an appropriate service area. Here, this work describes the minimum information that may be required to be able to automatically assign service area to the service request and then routing it to the appropriate service staff:

**User Id:** The identification of the user who initiated the service request in past.

**Service Request Id:** This unique id identifies the service request created by the user.

**Service Request Start Date and Time:** The data and the time at which the service delivery was started.

**Service Request Finish Date:** The data and the time at which the service delivery completed which started at the Service Request Start Date and Time.

**Assigned service areas and their percentage:** This information describes in which area the service request had been assigned and for how long it had been assigned to each service area. This information is useful when the service request required skills from different service areas.

Service request creation pattern may be extracted using the past history of the activities of the user. Service request creation pattern may be maintained in a database to avoid the need to calculate the creation pattern every time a service request is created. The example shows the sample of the information that can be retained in a database for easy retrieval.

**User Id:** The user id and other identification information such as full name.

**Service Request Creation Pattern Id:** The identification id of the service request creation pattern.

This information is used to retrieve the full details of the service request creation.

**Currently Effective:** This information describes whether the service request creation pattern is currently valid or not.

**Pattern Validity Start/Finish Date and Time:** This information describes the life cycle of the service request creation pattern.

The information that is used to define a pattern of service request creation is described below.

**Message Creation Pattern Id:** This information uniquely identifies the service request creation pattern.

**Start Date:** This is the start date at which this message creation pattern became evident.

**Finish Date:** This is the time at which this message creation pattern disappeared.

**Mostly used serviced area:** During the period defined by above Start and Finish Data, the service requests have been assigned to this service area most of time.

**Average criticality of the service request:** The average criticality of service requests submitted during period defined by starts and finish date.

### ***Service Requests Storage Area***

This area contains multiple queues for the service requests from the service requests. There is one to one relationship between the queue and service area. Service requests with assigned service area with them are dispatched to the corresponding relevant queue.

Every queue is identified a unique id and is assigned a service area. The service requests assigned to

the service request area are stored in the database.

# Chapter 4

## Optimized flow of the service requests

Figure 3 describes the optimized flow of the service request processing based on the architecture proposed by this publication.

Step 1: Service requestor logs into the portal using his authentications

Step 2: Service requestor creates a service request with or without providing the area of service

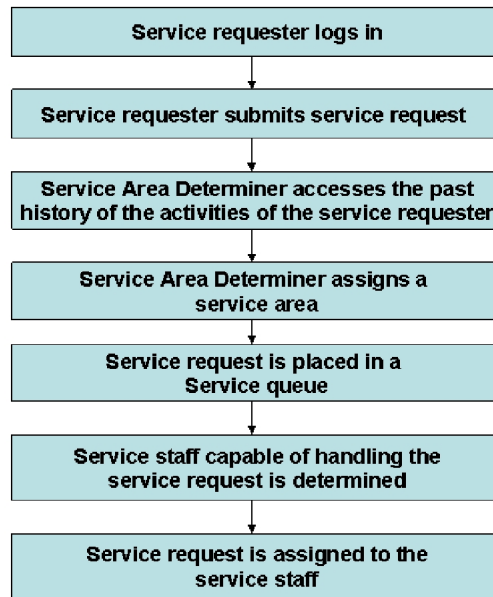
Step 3: Area Determiner looks at the history of activities in past for the user. Area determiner may use the raw history data or the raw history data which is already compiled in a useful form.

Step 4: The service request is assigned a service area by Area Determiner. In case, the service requester has also added area of service, the portal may use rules to determine which area of service to use in message routing. The rules may use information from past such as how frequent the service requester has been assigning incorrect service area to the service request.

Step 5: The service request is placed in the queue serving the area of service by Locator and Forwarder.

Step 6: Locator and Forwarder finds the service staff and the service unit for delivering the service

Step 7: When service staff logs on into the portal, he/she finds the service request assigned to him/her.



**Figure 3: Flow of service request processing**



# Chapter 5

## Summary

Commercial organizations setup distributed service organizations to serve customers in different countries. Portal is used as a unified mean of communications between the customers and the service staff. Due to different reasons the service requests created in the portal may be routed to wrong queues thus delaying the processing of the service requests. This publication describes an approach which uses the history of the activities of the service request creator to automatically determine the right service queue and the right service staff with the appropriate skills, thus reducing the financial cost of processing service requests in the globally distributed service organizations.

# References

- Agnihotri, S., Sivasubramaniam, N., & Simmons, D. Leveraging technology to improve field service. *International Journal of Service Industry Management*; 2002. 13(1), 47-68.
- Blumberg, MR. Technological developments and approaches to improving service quality. *Biomedical Instrument Technology*; 1999. 33(1), 35-44.
- Dossani, R., & K. Martin. *The Next Wave of Globalization? Exploring the Relocation of Service Provision to India*. Working Paper 156 September 2004  
The Berkeley Roundtable on the International Economy; 2004.
- Firestone, J. M. *Enterprise Information Portals and Knowledge Management*. Elsevier; 2002.
- Gant, J. P., & Gant, D. B. Web portal functionality and state government e-service. *Proceedings of the 35th Annual Hawaii International Conference on System Sciences*, 2002. 2002; 1627-1636.
- Gomez-Mejia, L. R., & Palich, L. E. Cultural Diversity and the Performance of Multinational Firms. *Journal of International Business Studies*, 28; 1997.
- Herskett, J. L., & Sasser, E. W. *The Service Profit Chain*. Free Press; 1997 .
- Houston, M. B., Bettencourt, L. A., & Wenger, S. The relationship between waiting in a service queue and evaluations of service quality: A field theory perspective. *Psychology and Marketing*. 1999;15(8), 735-753.
- Jaydip, M. R., Koong, K. S., Liu, L. C., & Chun, S. Y. An identification and classification of enterprise portal functions and features. *Industrial Management & Data Systems*. 2003;103(9), 693-702.
- Kumar, R., & Kumar, U. A conceptual framework for the development of a service delivery strategy for industrial systems and products. *Journal of Business & Industrial Marketing*; 2004 19(5), 310-319.
- OECD Corporate Staff. *Gateways to the Global Market*. Organisation for Economic Co-operation and Development; 1998.
- Scarlett, R. H., & Koslow, L. E. *Global Business*. Gulf Professional Publishing; 1999.
- Markeset, T., & Kumar, U. Design and development of product support and maintenance concepts for industrial systems. *Journal of Quality in Maintenance Engineering*; 2003 9(4), 376-392.

- McLaughlin, C. P. & Fitzsimmons, J. A. Strategies for globalizing service operations. *International Journal of Service Industry Management*; 1996. 7(4), 43-57.
- Morris, A. C., & Whang, S. Competing in Product and Service: A Product Life-Cycle Model. *Management Science, Frontier Research in Manufacturing and Logistics*; 1997. 43(4), 535-545.
- Nachum, L., & Aharoni, Y. *Globalization of Services*. Routledge (UK); 2000.
- Poisant, J. *Creating and Sustaining a Superior Customer Service Organization*. Quorum/Greenwood; 2001.
- Raghavan, P. Social networks: from the Web to the enterprise. *IEEE Internet Computing*; 2002. 6(1), 91-94.
- Ruyter, K. d., Wetzels, M., & Kleijnen, M. Customer adoption of e-service: an experimental study. *International Journal of Service Industry Management*; 2001. 12(2), 184-207.
- Rust, R. T., & Kannan, P. K. E-service: a new paradigm for business in the electronic environment. *Communications of the ACM archive*; 2003. 46(6), 37-42.
- S. Staab, & A. Maedche. 2001. *Knowledge Portals Ontologies at Work*. The AI Magazine; 2001.
- Tatnall, A. *Web Portals*. Idea Group Inc; 2004.
- Tidsskrift, N. G. *Service industries in the global economy*. Routledge, part of the Taylor & Francis Group; 2004.
- Tsang, A. H. C., Jardine, A. K. S., & Kolodny, H. Measuring maintenance performance: a holistic approach. *International Journal of Operations & Production Management*; 1999. 19(7), 691-715.
- Wimmer, M. A., *Integrated Service Modeling for Online One-stop Government*. *Electronic Markets*; 2002. 12(3), 149-156.
- Zhang, S., Bernd, H. S., & Haley, H. Language and Culture: Linguistic Effects on Consumer Behavior in International Marketing Research. *Handbook of Research in International Marketing*; 2003. 228-242.