



## Test Factory Setup for SAP Applications



- Barry Cooper-Brown, Diageo  
Chandur Ludhani and Sailesh Chandrasekaran, Infosys

### Abstract

Emergence of IT enabled business growth is compelling organizations to give testing and testing related strategies the much needed importance. By now, it has been reaffirmed that the cost of a single development defect can snowball to many times the original cost, if not discovered until the QA phase of testing and eventually showing up in the Production Environment.

However, when it comes to SAP there are unique testing challenges to deal with. The challenges of SAP testing will present you with both tradeoffs that need to be considered and the choices that need to be made about the kind of testing that is needed for your QA organization. The following point-of-view has been written based on the engagement between a major drinks manufacturer and Infosys, describing a successful approach of setting up a Test Factory to manage testing of SAP applications.

## Challenges in managing changes in SAP

Today's unrelenting economic and financial pressures, coupled with far too many internal and external factors (beyond the control of any organisation's circle of influence), are compelling organisations to change and tailor their business processes accordingly. These changes, most often than not, necessitate a change in the very supporting business applications itself (example, SAP, Oracle, etc.)

Acquisition of new business, opening of new facilities, introduction of new business line, consolidation of service lines, Regulatory Changes like changes in tax laws, changes in reporting needs, etc., incorporating these changes to SAP is fairly complex. Any update, even if major, moderate or minor, needs to be completely analysed from several dimensions keeping in mind that these are all large business applications. The result is that organisations end up managing projects involving a high number of interrelated or moving parts. Further, SAP applications span geographies and often need heavy customisations to suit local requirements (like government, language, etc.) and have multiple vendors running the applications. Every investment that an organisation makes in its IT systems is channelled towards ensuring a smooth running

application which indirectly gets mapped to reaping benefits for all its stakeholders namely the customers, employees, shareholders, etc. Often these investments do not bear fruits and are in turn viewed as a cost. For example, a delay in readying the application for regulatory changes, could lead to serious consequences for the organisation in the region within which the changes were mandated. Another such example could be with encountering incidents in the live environment or facing downtime with particular applications leading to severe business disruption.

Organisations are constantly on the lookout for innovative ways to help adapt quickly to these changes in the SAP business processes. Their ability to do so also facilitates:

- Improvement of delivery confidence with every change deployed
- Reduction in cost of every change implemented
- Ability to contract the overall lead time required for such activities thereby allowing more frequent releases

An organisation's inability to do so, leads to a host of challenges to the employees who interface with SAP for their day-to-day activities:

- Long time for deploying the SAP changes, means more business application downtime
- Leakage of defects to production—hampering their day to day operations
- High number of defects detected during User Acceptance Testing (UAT) resulting in a delay of final application go-live.

The question therefore is whether there is a single and efficient solution available to organisations in managing their SAP related QA/Testing operations, inexpensively and efficiently?

The concept of Test Factory and the offering under the business tag of NEM (New Engagement Models) is gaining traction across the globe. The Test Factory, also an alias for Managed Test Service or Testing Centre of Excellence, acts as an independent function in the SDLC; whilst supplanting the existing set of processes with benefits of a more agile, efficient and repeatable set of processes.

In our next section, we explore the business needs of SAP enabled organisations to deploy a Test Factory model setup for their QA organisation.



## Understanding the Business Need

Listed below are some of the common pitfalls encountered by SAP enabled organisations in running their QA functions -

### 1. Decentralised Testing

This model of testing is usually prevalent in organisations which have undergone mergers or made acquisitions. Testing in such organisations is carried out using a decentralised model where no common testing processes and methodologies exist. Each Line of business (LOB) has its own processes and differences exist even within units of the same LOB. In most cases, testing is managed by the development team itself, being aligned directly to each project.

This model does not provide clear delineation between the build and test functions. If there are any inefficiencies or delays in build, then the same is compensated for in the testing phase by either compressing the testing timelines or by moving forward with inadequate coverage of business scenarios. Individual teams often adopt the approach of testing with a self defined set of testing processes and scope limited to their project. The result is the lack of co-ordination when it comes to delivering together with other ongoing projects. This not only results in severe delays in the programme go-live, but also leads to a severe compromise of the quality and quantity of testing that is necessary.

Most common limitations of this approach:

- Lack of defined uniform testing processes and global governance based on metrics
- Duplication of test effort
- Non – conformance of testing timelines

- Inconsistent in application test quality across teams and
- Lack of usage of appropriate testing tools

### 2. Governance Challenges

Organisations running SAP are continuously engaged in taking up large change programmes or rolling out applications to newer regions. A large change programme or rollout requires the QA function to constantly generate status reports and deal with various risks and issues.

Absence of defined processes, metrics to track progress, risk management and inability to consolidate reports frequently, leads to a governance challenge with respect to managing decentralised QA teams. Another common problem encountered with decentralised QA teams is with the large amount of time consumed in assimilating and consolidating information for status reporting from various regional teams and resolution of risks and issues. Further, under the decentralised structure, teams lack adoption of uniform processes and hence there are bound to be differences in the content and structure of status reporting and the way risks are identified and dealt with.

### 3. High Cost of Testing / Maintenance

Sound testing processes and deep business knowledge are pre-requisites to testing of SAP applications. We have also learnt earlier that a large amount of effort is spent in running the QA function for a SAP enabled organisation. Majority of organisations dedicate a large number of resources for testing of SAP releases.

In addition to this, SAP testing involves testing some portions of business functionalities repeatedly and often decentralised teams lack the benefits associated with the reusability aspect. This can be cited as an additional reason for the inflated costs of SAP testing in a decentralised model.

Project based QA teams primarily look at testing from a very narrow project point of view and often miss the holistic implication of the changes from a complete business landscape perspective. This leads to high efforts from the business users during UAT and large number of defects getting identified in the later stages of testing. In addition to this, the non-functional testing aspects such as Performance, Security etc., are also overlooked in the initial phases of testing leading to high amount of re-work and maintenance costs downstream.

### 4. Lower Delivery Confidence and Higher Time-to-Market

There is very low confidence on delivery of release considering the testing in the earlier phases is not really focussed on business knowledge. This results in a high percentage of defect identification in later stages of SDLC. In the absence of benchmark metrics, there is no opportunity to measure the test execution productivity, often leading to increased durations of testing cycles.

While these may sound like age old problems and issues, these are indeed the common issues across organisations. These pitfalls are the reasons why organisations find themselves grappling with an expensive and a non-yielding QA function.



## So, What is a Test Factory?

Having looked at what is ailing SAP based organisations, setting up a Test Factory can be the most definitive solution available in the market currently. Test Factory is a centralised testing model that brings together people and infrastructure into a shared services function adopting standardising processes, effective usage of tools, high reuse and optimising resource utilisation in order to generate required benefits for the organisation.

Let us broadly explore the solution that a

Test Factory can provide –

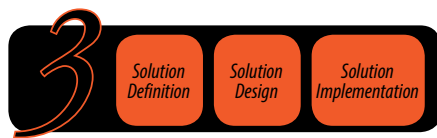
- a. Test Factory acts as an independent function in the SDLC and resolves the very first ailment by having a clear delineation between the Build and Test functions of an organisation.
- b. Test Factory is setup as a centralised QA function which brings in uniform process adoption and an enterprise wide QA approach with easier governance. Test Factory is also

setup with the attributes of a more agile, efficient and repeatable set of processes.

Test Factory can also be operated in the new engagement model (NEM) format which helps in measuring the business value linked to the services offered, example; pricing is based on the work performed instead of traditional Time & Material models.

## Implementing a Test Factory

The entire process of implementing a Test Factory involves 3 major phases –



### Solution Definition Phase

“Building the Case for Organisational Buy-in”

One of the most essential starting points of the entire Test Factory setup involves assessing the existing organisational test processes, determining the maturity level of the processes and deriving the gaps observed. The solution definition phase involves arranging for one-on-one or group interview sessions with various stakeholders, in the existing ecosystem, and understanding the various pros and cons of the existing processes. Alternatively or additionally, a questionnaire pertaining to the respective areas of the stakeholders can be used to help document the same. For assessing the maturity, organisations

are spoilt for choices with widely known Test Maturity models such as the TMMi, TMAP, TPI or the ITMM (Infosys Test Maturity Model).

The ITMM is a well-blended model which builds upon the standard Test Maturity models and also adds further dimensions to its fabric in being able to evolve constantly to the changing business context.

The assessment results show the current level of maturity of the organisation's processes. It is of utmost importance at this stage to bring together the leadership team of the organisation and showcase the various process improvements and benefits of moving the organisation to the higher levels of maturity. On the basis of the agreed level of maturity to be targeted, the ITMM model allows for a continuous improvement process to be imbibed into the organisation. Once an agreement is reached, a roadmap is devised on how the solution is to be designed and implemented.

### Solution Design Phase

“Structuring A Winning Solution”

The Solution design phase is a core component in the Test Factory setup process and involves designing processes on three dimensions of the ITMM model –

- Test Engineering Dimension, covering the focus areas of Requirements Gathering, Test Strategy, Testing tools, Test Data and Environment
- Test Management dimension, covering the focus areas of Estimation, Test Planning, Communications, Defect Management and Knowledge Management
- Test Governance dimension, covering the focus areas of Test Methodology, Test policy, Organisational structure and Test Metrics

The most important key areas to focus would be to design the processes for -

- **Test Methodology**  
Defining various types of testing to

be performed, estimation techniques, entry and exit criteria for each testing phase, testing environment set-up, operating model and various input and output artifacts

- **Test Governance**  
Defining the governance structure and chalking out clear test roles and responsibilities
- **Test Factory Structure**  
Defining the various communication paths within and outside the Test Factory
- **Metrics, KPIs and SLAs**  
Defining the various testing related metrics and ensuring agreement on the various SLAs and KPIs for each role and processes in the Test Factory
- **Knowledge Management Framework**  
Defining a centralised service to allow effortless and effective sharing of knowledge between teams, across knowledge assets

In addition, teams may create, test data management processes, a catalogue of the testing services, non-functional test services methodology, Guidelines for various Testing tools and Testing Policies.

The solution design phase is a highly collaborative process in which the design and delivery teams play equal roles. It involves both, fine tuning some of the current processes and completely revamping the rest. The implementation of the solution in the right manner, and with the right amount of calibration, can

bring about bountiful benefits to the organisation in having a sound testing process.

## Solution Implementation Phase

“Walk the Talk”

Depending on the level of maturity that organisations choose to attain, this phase needs a good deal of time to be invested. The time taken to nurture the processes and imbibe them could range anywhere from six months up to two years, depending on the organisational buy-in and focus in implementing the same.

Having a good amount of time on hand, organisations also have the option of choosing to implement the processes in either a staggered manner or with a big bang approach. In general, it is advisable that a staggered approach be chosen.

In a staggered approach, the implementation team collaborates with the champion or manager of the Test factory prioritising the areas lacking basic maturity and identifying a pilot release in which the updated processes can be put to test. This allows the implementation team to lay out checkpoints where any anomalies can be corrected. At the end of the pilot implementation, a survey can be conducted with the stakeholders in determining the success and failures in the implementation. The lessons learnt at the pilot implementation stage are a crucial input to the next phase of implementation.

It is important to look at some of the frequently encountered challenges

associated with the solution implementation phase -

- **Aversion to change**  
This often is a sticky issue with teams unwilling to adapt to new processes as it involves moving away from the comfort zone
- **Poorly adapted processes and communications**  
This is an indication that the impacted teams are not aware of new processes and are not well trained
- **Handing over testing to Test Factory**  
Traditional approach of testing by business users due to lack of business knowledge by testing team is one of the most challenging change management aspects to deal with

It is therefore a task for both the implementation team and the Leadership team of the organisation in addressing these challenges / change management. The task of the implementation team lies in devising a thorough training plan for the various teams involved, designing user manuals and guidelines for any reference required to the new processes.

On the other hand, the task of the leadership team is to put together a strong communication plan, listing the benefits that accrue to, both the impacted teams and the business benefit in adapting the changes. In certain situations, grievance redressal efforts and holding communication forums is a good way to engage with the teams.

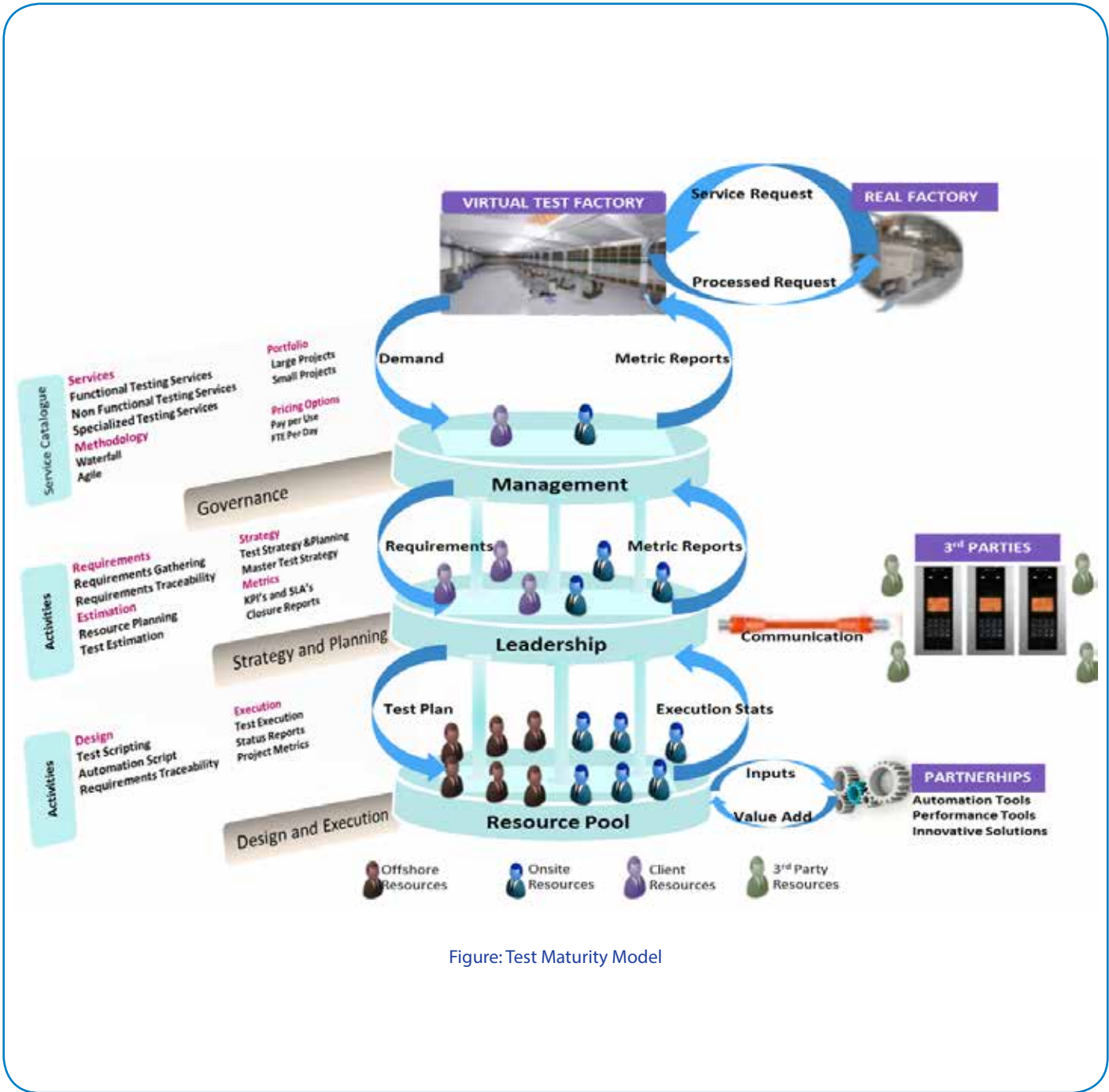


Figure: Test Maturity Model

## Benefits of a Test Factory

We have managed to explore the story of the Test Factory setup with the sound process framework forming the base, but the real icing on the cake is to see the benefits that accrue post setting up of the Test Factory.

Test Factory brings about a set of both Qualitative and Quantitative benefits. Some of the Qualitative and hard hitting benefits include

- Ensures high levels of repeatability, predictability and test coverage
- Delivers on business requirements driven end-to-end testing  
This helps in identification of critical defects and requirement gaps which would have been typically identified only during UAT phase
- Definition of key metrics  
Assists in tracking enabling effective

governance at every stage of the programme

- A reusable set of artifacts and test design, helping crash test planning and design timelines
- Reduce the UAT phase saving on delivery timelines
- Understanding of core business processes & building the core regression library
- Effective usage of tools enabling complete traceability from requirements to test cases and defects during various phases of the project
- Accelerated test automation helping in reduction of cycle time and execution costs
- Providing platform to have more frequent releases annually – This will

benefit the business and end users in moving away from the erstwhile lower frequency, which meant having to wait long for the release of the important Business/IT changes

- One-stop shop for various testing needs – Performance Testing, Security Testing, UAT Support etc.

### Quantitative benefits include

- An estimated cost saving of 50% owing to reuse of the test design artifacts
- An expected 40% reduction in execution cost with automation of test build and
- Near zero defect leakage from System Integration testing to UAT and Go-Live, ensuring faster time to market and less Production downtime.

## Conclusion

Setting up a Test Factory can give organisations a unique insight into how they can successfully tailor and reinvent the traditional onsite-offshore model for ensuring effective and comprehensive application testing. In addition to the cost benefits, with the adoption of the Test Factory approach, organisations emerge with an integrated and comprehensive SLA driven QA organisation with tightly knitted processes. One of the most enterprising advantages with a Test Factory setup is the ability to add further services associated with Testing and without having to largely tweak the underlying processes framework. This helps the organisation in quickly on-boarding and implementing testing skills and processes required for the supporting of new business initiatives oriented towards upcoming areas like Cloud, Mobility, Social Commerce, etc.

The Test Factory model is a welcome addition to the plate of offerings by Service firms and is definitely a force to reckon with in the foreseeable future.

## About the Authors

### Barry Cooper-Brown

*Test Manager, Diageo*

Barry is Test Manager with Diageo plc and is based in London. He has over 20 years of experience working with SAP across many disciplines from Basis to programme delivery. He has worked for over 14 years within the FMCG sector and has specialised in delivery of projects and programmes of SAP solutions. Currently Barry is the Test Factory Manager for Diageo responsible for the implementation and running of a Global Test Organisation across Multiple regions and SAP solutions.

### Chandur Ludhani

*Principal Consultant, Infosys*

Chandur is a principal consultant with the Retail, CPG and Life Sciences unit of Infosys and has over 15 years experience. He has experience on ERP Product development, Testing, Implementation and Support. As part of the testing engagements, he has helped clients in setting up the processes related to various types of testing services - Manual testing, Automation etc. leading to Testing Centers of excellence.

### Sailesh Chandrasekaran

*Senior Consultant, Infosys*

Sailesh is a senior consultant and has over 6 years of experience working for clients in Retail, Banking and Financial Services industry. He helps clients in assessing the maturity of their test organizations, improving their testing processes and transforming them into Centers of Excellence.

For more information, contact [askus@infosys.com](mailto:askus@infosys.com)



© 2017 Infosys Limited, Bengaluru, India. All Rights Reserved. Infosys believes the information in this document is accurate as of its publication date; such information is subject to change without notice. Infosys acknowledges the proprietary rights of other companies to the trademarks, product names and such other intellectual property rights mentioned in this document. Except as expressly permitted, neither this documentation nor any part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, printing, photocopying, recording or otherwise, without the prior permission of Infosys Limited and/ or any named intellectual property rights holders under this document.