



Title: Enterprise Software Landscape, a case for Trinity

Overview:

Most organizations irrespective of the industry are engaged in three important functions:

1. Sales & marketing (Customer Facing)
2. Business Execution (Project Execution, Process Automation, Product Development)
3. Finance, Budgeting, Inventory, Payrolls etc


Each of the above three is a specialized area and requires focussed software solutions. However these should be seamlessly integrated to have end-to-end software enablement across the enterprise. This paper will discuss the usage of each software & how an integration approach among this trinity of software will bring the best results for an enterprise.

Software Trinity

ERP

The case of ERP (SAP, Oracle, etc) is well established across industries. It was first adopted by manufacturing industries to manage their Inventories, Production Planning, Material Procurement, Budgeting, Finance, Payrolls & related function. It is now being embraced by services sector, power sector, financial institutions & several others. After the ERP has been implemented & stabilized, it is realized that the areas of Product Development, Project Planning & Execution, Resource Management, Quality Assurance, document management are not covered and needs attention. It is also realized that ERP does a good job of keeping the transactional data, it's not easy to automate the business process across different functions. ERP usage is limited to the purchase, finance, stores, accounts etc. Users in the engineering, R&D, field services, quality assurance either have limited exposure or usage in the ERP. While ERP may not solve all problems, it is most likely to be the 1st part of enterprise solutions trinity.

CRM

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One of the areas which gets prime visibility in the enterprise is sales & marketing. It is required to track all leads, opportunities, customers, contacts etc. There are several independent software solutions available either in hosted or 'On Premise' model. The lead is first captured here and once converts into a sale. Over a period of time, it is realized that this CRM Id needs to be tracked till the services/products are delivered and invoices all paid. This initiates the topic of integration with CRM and people get convinced that CRM cannot work in isolation. So as soon as 2nd part of the trinity, CRM, is introduced and so does the topic of integration.

Business Execution

As described earlier, even after the implementation of ERP, several areas of Product Development, Project execution, Quality Assurance, Engineering drawing management are not covered. The result is that enterprise is facing challenges in delivery with no visibility on project execution, resource utilization. Delay in projects have cascading effect on cash flows. The problems are further aggravated by the dogging quality issues in the absence of centralized drawings and document repositories, quality management & compliance systems. Everyone now feels the need to automate these processes using IT. The ideal solution for this is web based collaborative platform which can provide the following key functions:

1. Project Planning, Execution & Monitoring
2. Business Process Management (Workflow Automation)
3. Product Data Management, Change Management
4. Document & Drawing Management

In most cases, the enterprise is already mature having implemented ERP and perhaps CRM, the importance of integration is already pointed out upfront. Debate is not about the integration or no integration but about the points of integration, how this system fits in with current ERP and CRM. So this becomes the 3rd and final part of the enterprise solutions trinity and its integration with the other two would be discussed in the next section.

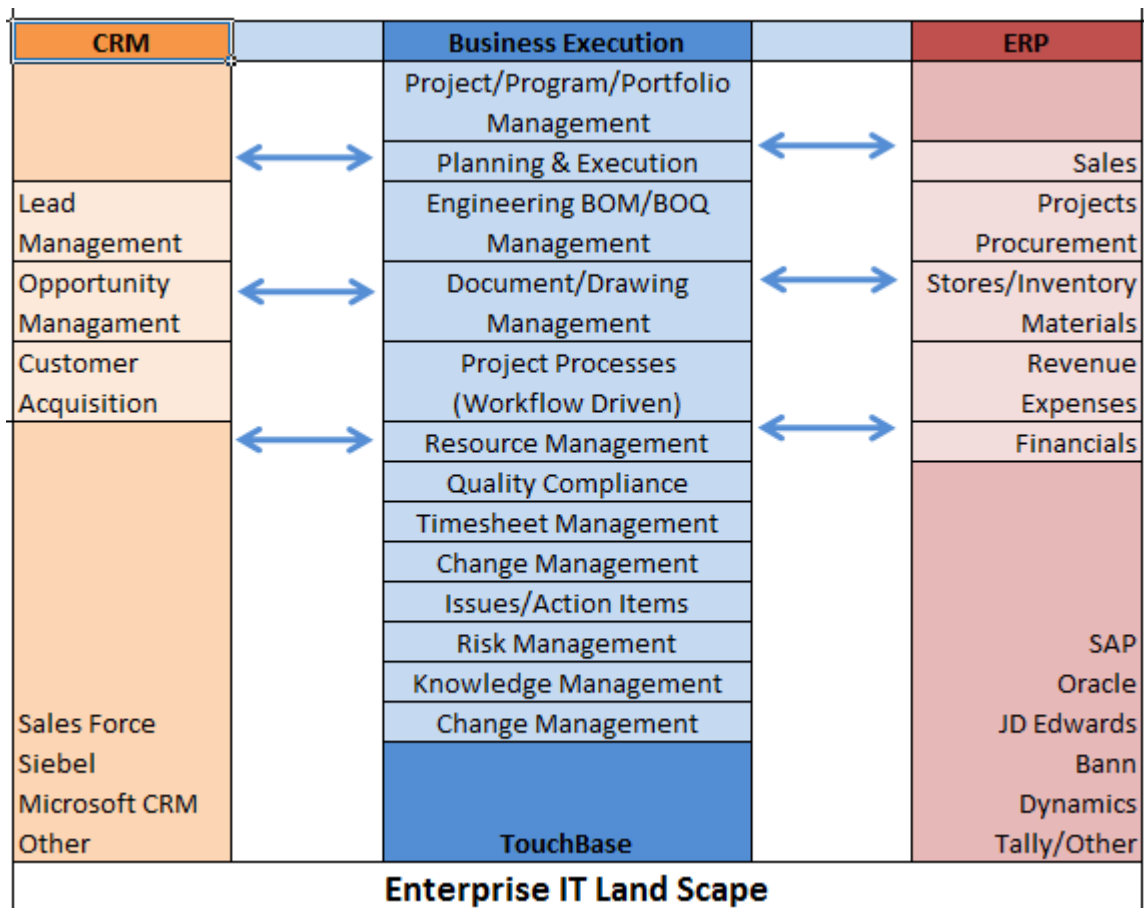
Integration

The need to integrate the ERP, CRM and Execution Software is well established. Two questions which becomes important are:


1. What needs to be integrated or what are the integration touch points?
Which system owns which master data?
2. What should be integration methodology? Should it be real-time, should it be scheduler based import/export?

There is no standard answer to the above questions and will depend upon several factors including the nature & definition of business process, business process requirements, the actual software's being used, IT investment budgets (decides the nature of integration) etc.

The following diagram shows the three software solutions & the key functionalities they offer. The figure also shows some of the software solutions in the respective space:




Software Trinity – CRM|Business Execution|ERP

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Once the respective functionalities of the three software are established and implemented, let's try to find the integration touch points. The following table depicts a simple business use case and we will find out the integration touch points in this case.

Business Process Workflow/Activities


Activity Serial No.	CRM	Business Execution	ERP
1	Generate Lead		
2	Business Won, PO Received		
3		Contract Review, Project Request Created, PO Attached	
4			Sales Booked, Project No generated, Budget Allocated
5		Project Planning, Material Request/Approval	
6			Material Issue if available, Else purchase & Issue
7		Milestone Achieved, Invoice Request	
8			Invoice Raised, Revenue Recognized, Payment Received,
9		Project Closed	
10			Raise Final Invoice, Recognize Revenue, Payment Received, Close Project

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CRM-Business Execution-ERP Software's Touch Points

S.No	Source System	Destination System	Touch point
1	CRM	Business Execution	All leads which are WON status should be transferred to the destination along with relevant info.
2	Business Execution	ERP	Project Request Details. This must result in creation of Project No & Booking of sale. Project request detail will contain customer info, PO details, Budget & other required detail. After successful creation of ERP project No, this will be sent back to Business Execution system for future transactions.
3	Business Execution	ERP	Material Request Details. This should automatically create material request transaction in ERP, issue the material and issue ID should be sent back for future reference. In case material to be procured, it must initiate the purchase requisition process
4	Business Execution	ERP	Milestone Achieved. This should initiate the invoicing process in SAP. The invoice details like invoice No and amount should be sent back for future reference and reporting purpose.
5	Business Execution	ERP	Project Closure. This should imitate the final invoice generation and Project closure.
6	ERP	Business Execution	Item Master. This should be searchable from Business execution system in real time fashion to check stock, material requisition etc.
7	ERP	Business Execution	Project Costs. All the project costs other than man power is captured in ERP. This cost can be updated in Business Execution system either on daily basis or real time basis.

Above table & procedure only shows the process of arriving at integration touch points. It should be clear that each organization will have similar but unique way of identifying the touch points and this the work of the implementation team implementing these software. The integration of these touch points will ensure that there is a linkage right from CRM to Business Execution to ERP. For instance if the milestone was completed in Business Execution but accounts person is not informed, invoice will be delayed and that will impact cash flow. There are several such business cases which make it business necessity to integrate these trinity of software's.

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Integration Methodologies

Another important question which needs to be answered is the mode of integration. There are typically two ways of doing integration:

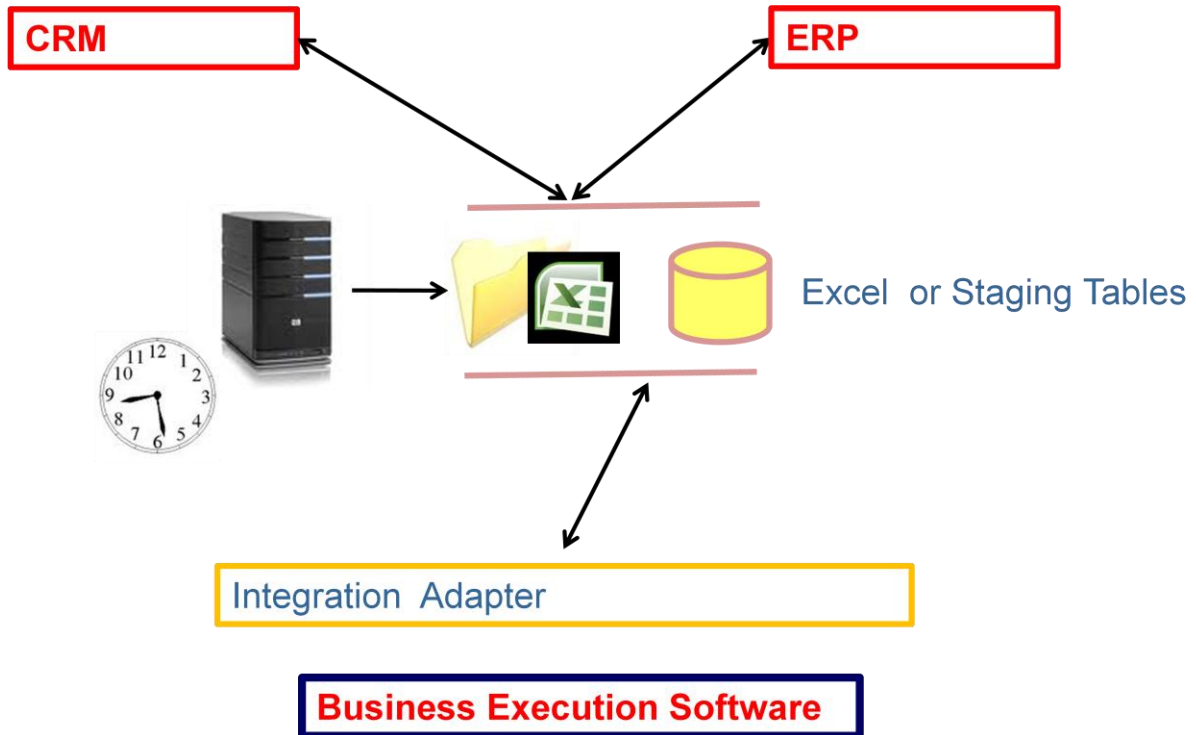
1. Scheduler Based Import/Export through Excel /CSV or Staging Tables
2. Integration using API/Web Services/Connectors

Scheduler Based Import/Export through Excel /CSV or Staging Tables

This is simple & yet very powerful way of integrating different applications.

Requirements & Process:

1. Both the source & destination software's have the ability to import/export and validate using some common medium like excel or CSV.
2. Data to be exported is written in pre decided excel format and kept in a predefined location (folder) or data is placed in the staging tables
3. The import utility of the destination system automatically reads it a time set by scheduler. Any exception or errors are written in audit trail.



CRM, ERP and Business Execution Software Integration Using Excel/Staging Tables

Benefits:

1. Transaction time in the source system doesn't get delayed because of the time taken in sending it to the destination system
2. If there is a problem in the destination system or network issue, the source system can complete the transaction as it is independent from the integration
3. Batch upload happens in parallel thread and thus doesn't hamper the performance of source or destination system
4. This type of integration is more flexible in nature and changes can be done without any development effort if build correctly
5. Relatively inexpensive

Shortcomings:

1. Any changes in the source system is not immediately reflected in the destination system
2. Becomes error prone when dealing with complex data model
3. Scheduler of Source & Destination needs to be synchronized and may take some time to stabilize



Potential Touch point Scheduler Based Integration:

1. Importing Project Costs from ERP to Project Execution. Since no one needs to track costs on an hourly basis, it makes perfect sense to import these once or twice in a day rather than immediate
2. Employee Leave information from Business Execution system to ERP for payroll. Since the payroll is calculated on a fortnightly or monthly basis, it's perfectly alright to send employee leave information on a daily basis.

Integration using API/Web Services/Connectors

This type of integration and ensures almost real-time changes in the destination system.

Requirements & Process:

1. Both the source & destination software's should have the required API/Web services for the integration
2. Appropriate Integration Connector is available to enable compatibility between source & destination system
3. As a particular event happens in source system, it will call the destination system API/web Service to send data and will only complete the transaction when the destination system sends out success flag to the source system.


Benefits:

1. Immediate change is reflected into the destination system
2. Source & Destination systems are always in sync
3. The entire business logic of the integration is embedded in the API
4. Data integrity is always maintained

Shortcomings:

1. Any changes in the integration requires programming effort & development lifecycle
2. Requires both destination & source system to be 100% available and so the network connecting them.
3. Relatively Expensive

Potential Touch point Scheduler Based Integration:

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1. Material Stock values in Business Execution system. Since this is a dynamic value and its current value is of important and therefore this needs to be real time integration

Conclusion:

1. CRM, Business Execution & ERP forms the trinity of enterprise solutions for an enterprise.
2. These software should be used in an integrated manner to get the best out of them.
3. Integration touch points needs to be identified and depends upon each enterprise business processes
4. Appropriate integration methodology should be adopted depending upon the touch point need.

Acknowledgement:

The concept of trinity was originally pointed by one of ProductDossier customers. We acknowledge the contribution.

About ProductDossier:

ProductDossier in an enterprise software & solutions organization. Its flagship 3PLM (Project, Process & Product Lifecycle Management) solution platform is being configured to provide solutions across industries. The platform can be further integrated with ERP, CRM and several other software including CAD authoring tools, viewers, MS Office, MS Project, Windows Explorer, MS Outlook, Tally & so on.

ProductDossier solution is being used by several of the large & mid size corporations across the continents. For more information, please visit <http://www.productdossier.com>