odoo

SAP Business One

NETSUITE

Microsoft Dynamics AX

MRP Comparison White Paper:

Microsoft Dynamics AX, Netsuite, Odoo & SAP Business One

August 2016

Introduction

A manufacturer looking to upgrade their management software from a legacy system or implement an ERP software for the first time is faced with a multitude of choices. Each part of the manufacturing process is covered by its own software. For example, a manufacturer might run MRP software to plan production, MES to manage the shop floor, CMMS to manage maintenance, QMS for quality control, and WMS to track inventory. Most ERP systems on the market cover several of these functional areas, but few truly do everything out of the box. Most rely on third-party add-ons and integrations to provide complete coverage. This is particularly common for operations outside the core manufacturing workflow, such as maintenance, PLM, and quality management.

Choosing the Right Software

Whether you are outgrowing entry-level software or replacing a legacy system, choosing an ERP that is a good fit for your company can have a strong impact on your future growth and profitability. There is tremendous pressure to get an ERP implementation right the first time because the cost is so high. Implementation requires a great deal of time and input from employees across your organization, furthermore licensing and consulting fees can be significant.

Despite these high stakes, most decision makers selecting and implementing ERP software will not do so more than a few times in their career. The purchasing relationship is therefore tilted in favor of the vendor, with many vendors requiring hours of qualification before revealing crucial details such as features and pricing. When dealing with vendors, it is therefore essential to accurately and completely communicate the needs of your organization to avoid finding out 6 months into implementation that the project isn't feasible or that an unexpected and expensive custom development is required.

Cloud or On-Premises?

In recent years there has been a trend in business software towards a software as a service (SaaS) model. Most major business software vendors, ERP or otherwise, have begun offering their locally installed products in a cloud-hosted version to provide additional flexibility. When deploying a cloud-based software, there is no need for a local server or other network hardware, as data is managed and processed on a secure off-site server. Depending on the size of the deployment, this can significantly reduce the initial cost of a system. This can make a cloud solution a better choice for small and medium size businesses with less capital.

As data security concerns grow, many organizations must make the decision on how they would like to store their data. Due to the initial overhead and high maintenance costs of a secure locally hosted software solution, many businesses are now considering cloud-based SaaS providers as a low cost/high security option for their operational software needs.

Third-Party Integrations and Add-Ons

While most features missing from an ERP can be added through an add-on or third-party integration, doing so increases the cost and complexity of a solution. It requires a higher level of expertise during implementation and can create instability in performance and compatibility issues during upgrades. It is therefore advisable to select a software that covers all of your core business functions out of the box, only relying on add-ons when absolutely necessary.

For this reason, the trend among manufacturing software solutions has been to incorporate more and more features into the core package. Each software included in this document covers several of the most important functional aspects of a manufacturing business. Each new version of these software solutions, too, has seen the inclusion of new features which widen their functional breadth.

Automated Data Collection on the Shop Floor

An important benefit conferred by modern manufacturing software is a high level of control over the physical production process via automated data collection. Automated data collection has a number of advantages over traditional manual monitoring and time-tracking. It takes no additional labor to collect accurate data that is free of human error and provides an unparalleled granularity of insight into the production process. The opportunities for process improvement are profoundly valuable for workflow optimization, saving time and labor costs.

Software Compared in this Document

The four software solutions compared in this document were chosen because they represent a reasonable sample of the mid-market manufacturing solutions available today.

Comparing MRP Software Offers

Microsoft Dynamics AX

Microsoft Dynamics AX is the most feature-rich of the of five products in the Microsoft Dynamics ERP line. AX was originally released as a collaboration between IBM and Daamgard Data (as IBM Axatpa) in 1998 before being acquired by Microsoft in 2002 and re-branded under its current name.

> “ MICROSOFT’S ERP SOLUTION ”

AX is designed for mid-to-enterprise size businesses operating across multiple locations, countries, or currencies. Dynamics AX has particular strengths in manufacturing and distribution. It is commonly deployed by companies with revenue greater than $50 million annually, though smaller implementations are also possible. It is commonly used by discrete manufacturers, though it is also deployed by process manufacturers and in the retail industry. AX is offered both in the cloud and as an on-premises installation, sold exclusively by value-added resellers. For this comparison, we chose the latest release, AX 2012 R3, in the on-premises configuration.

19,000
companies

30
countries

12,000
usergroup members

25
languages

NetSuite

NetSuite was founded in 1998 as NetLedger, a cloud-hosted accounting software. It has since grown into a full-spectrum suite of business software applications. True to its name, NetSuite is available exclusively through the cloud.

> “ THE WORLD’S NUMBER ONE CLOUD BUSINESS MANAGEMENT SUITE ”

NetSuite employs a modular structure, with each deployment comprised of a selection of its core modules or “apps”. NetSuite offers preconfigured “suites” of apps to match the needs of different market segments. Apps are also sold a la carte, ranging in price from $199 to $499 each. Some modules exist as basic and advanced versions. In our comparison, we used the more advanced modules when available.

30,000
customers

160
countries

312
apps in SuiteApp

4,500
employees

Odoo

Odoo is an open-source suite of business apps. It is built on a modular structure in which each app covers one business function and each app is installed as needed. Odoo is available to be installed on-premises as well as in the cloud. Odoo recently released a new version of its manufacturing app suite, adding quality, maintenance, PLM, and expanded MRP and MES functionality. In this document, we will compare the on-premises configuration of the latest release, version 10.

> " GROW YOUR BUSINESS "

Support and implementation services for the on-premises edition are sold by Odoo certified partners, while support for the SaaS is provided by Odoo itself. The on-premises edition has thousands of community-developed modules which add or modify functions, allowing a high degree of flexibility. The SaaS only allows the installation of the three-dozen modules officially supported by Odoo Inc.

2+
million users

730
partners

120+
countries

1,300
developers

SAP Business One

SAP, born from the ashes of the Xerox business computing division, is the venerable purveyor of enterprise software, primarily selling built-to-suit solutions for large enterprises. In 2002, SAP made its first foray into the SME market segment with the purchase of what is now SAP Business One (SBO). SBO is the lowest cost ERP offering from SAP, designed to be deployed quickly and with minimal customization.

> “ THE BEST RUN BUSINESSES RUN SAP ”

Business One is designed to cover every business software need of small to mid-sized businesses, from CRM to Manufacturing deployed either in the cloud our on-premises. SBO is best suited to light manufacturing as it lacks advanced planning and shop floor control features when deployed out-of-the-box. There is a large community of value-added resellers, many of which have developed their own modules to add the missing features needed for more complex manufacturing processes.

50,000
customers

190
countries

670
partners worldwide

650,000
users

Features Comparison

Inventory Management	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
General				
Multi-Warehouse	✓	✓	✓	✗ [1]
Storage Locations (Bins)	✓	✓	✓	✓
Bin Replenishment	✓	✓	✓	✓
Mobile Device Support	✓	✓	✓	✓
Multi-Company	✓	✓	✓	✓
Multi-Currency	✓	✓	✓	✓
Multi-Language	✓	✓	✓	✓
Automatic ASN (Advanced Shipping Notice)	✗	✓	✗	✓
Package Management / Cartoning	✓	✓	✓	✓
Freight Carrier Integration	✓	✓	✗	✓
Manage Consignee Stocks	✓	✗	✓	✓
EDI (Electronic Data Interchange)	✗ [2]	✗ [3]	✓	✗ [4]
Products				
Non-Stocked Inventory [5]	✓	✓	✗	✗
Multiple Variants	✓	✓	✗	✓
Multiple Units of Measure	✓	✓	✓	✓
Inter-class UoM Conversion [6]	✓	✓	✓	✓
Variant Matrix	✗	✓	✗	✓

1 NetSuite supports multiple companies, but only one warehouse per company.

2-4 EDI is available through third-party software.

5 Physical products for which we don't manage the inventory level.

6 Conversion of base and secondary UoM (i.e. Volume to Mass). Sometimes called secondary units of measure.

Inventory Management	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
Traceability				
Lots / Serial Numbers	✓	✓	✓	✓
Up / Down Traceability	✓	✓	✗	✓
360° Traceability [1]	✓	✓	✗	✓
Expiration Dates	✓	✓	✓	✓
Cycle Counting	✓	✓	✓	✓
Reporting				
Inventory Forecasts	✓	✓	✓	✓
Inventory Valuations	✓	✓	✓	✓
ABC Analysis	✗	✓	✗	✓
Barcode Support				
QR Code Support	✗ [2]	✓	✗	✗
RFID Support	✗ [3]	✓	✗ [4]	✗ [5]
Lots / Serial Numbers	✓	✓	✗ [6]	✓
Receptions	✓	✓	✗ [7]	✓
Picking	✓	✓	✗ [8]	✓
Internal Moves	✓	✓	✗ [9]	✓
Delivery Orders	✓	✓	✗ [10]	✓
Inventory Adjustments	✓	✓	✗ [11]	✓
Routing				
FIFO / LIFO	✓	✓	✓	✓
Customizable Routes [12]	✓	✗	✗	✓
Putaway Strategies	✓	✓	✗	✓
Wave Picking	✓	✓	✗	✓
Batch Picking	✗	✓	✓	✓
Zone Picking	✓	✓	✗	✓
Cluster Picking	✓	✓	✗	✓
Cross-Docking	✓	✓	✗	✗
Putaway Location By Size, Weight, & Capacity	✗	✓	✗	✓

1 Tracking product lots/serials from production to sales order to delivery order.

2 Odoo can read QR codes, but third-party software is required to print them.

3-5 Available through third-party add-ons.

6-11 SBO can accept barcodes as input in any field, but there is no barcode scanning interface.

12 Sometimes called push/pull rules.

Supply Chain	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
Features				
Vendor Data Management	✓	✓	✓	✓
Vendor Pricelist Management	✓	✓	✗	✓
Inbound Quality Control	✓	✓	✗	✗
Dropshipping	✓	✓	✓	✓
Purchases				
Purchase Requests	✓	✓	✓	✓
Purchase Orders	✓	✓	✓	✓
Purchase Approval Workflow	✓	✓	✓	✓
Request for Quotations	✓	✓	✓	✓
Contracts / Purchase Agreements	✗	✓	✗	✓
Automated Procurements				
Minimum Stock Rules [1]	✓	✓	✓	✓
Make-to-Order	✓	✓	✓	✓
Master Production Schedule	✓	✓	✗ [2]	✓

1 Sometimes called order points.

2 MRP Wizard may be used to automate procurement.

Manufacturing	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
Master Data				
Multi-Level BoM	✓	✓	✓	✓
Byproducts / Coproducts	✓	✓	✗	✗
Routings	✓	✓	✗	✓
Subassemblies	✓	✓	✓	✓
One BoM for Multiple Product Variants	✓	✗	✗	✗
BoM versions	✓	✓	✓	✓
Multiple BoM / Routing [1]	✓	✓	✓	✓
Planning				
Demand Forecasting	✓	✓	✓	✓
MRP I Scheduler	✓	✓	✓	✓
MRP II Scheduler [2]	✓	✓	✗	✓
Master Production Schedule	✓	✓	✗ [3]	✓
Gantt Chart Scheduling w/ Drag & Drop	✓	✓	✓	✗
Kanban Planning	✓	✓	✗	✗
Production Calendar	✓	✗	✗	✓
Infinite Capacity Scheduling	✓	✓	✓	✓
Finite Capacity Scheduling	✓	✓	✗	✓
Available to Promise	✗	✓	✓	✓
Multiple Scheduling Plans	✗	✓	✓	✓
Delivery Date Calculation (Backwards Scheduling)	✓	✓	✗	✗
Production Order Splitting/ Merging	✗	✓	✗	✗
Operations				
Manufacturing / Production Orders	✓	✓	✓	✓
Job Tracking	✓	✓	✓	✓
Work Orders / Operations	✓	✓	✗	✓
Automated Time Tracking	✓	✓	✗	✓
Disassembly Orders	✓	✓	✓	✗
Subcontract Manufacturing	✓	✓	✓	✓
Rework / Repair	✓	✓	✗	✗
Scrap	✓	✓	✓ [4]	✓
Disposal Strategies	✓	✓	✗	✗
Kits	✓	✓	✓	✓
Edit Individual Production BoMs	✗	✓	✓	✗

1 Ability to create multiple BoMs or routings for a single product.

2 Ability to schedule work orders based on workcenter capacity and availability.

3 MRP Wizard performs a similar function.

4 Constant Scrap Only.

Manufacturing	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
Costing				
Perpetual Inventory Valuation [1]	✓	✓	✓	✓
Periodic Inventory Valuation [2]	✓	✓	✓	✗
Standard Price	✓	✓	✓	✓
FIFO	✓	✓	✓	✗
Landed Costs	✓	✗ [3]	✓	✓
Actual Production Labor	✓	✗	✗	✓
Production Order Costing	✓	✓	✓ [4]	✓
Shop Floor Control				
Shop Floor Terminals	✓	✓	✗ [5]	✗
Production Activities	✓	✓	✓	✓
Non-Produciton Activities [6]	✓	✓	✗ [7]	✗
Time Tracking	✓	✓	✗	✓
Messages on Work Orders	✓	✓	✗	✗
Barcode Support	✓	✓	✗	✓
Equipment / Machine Management	✓	✗	✗	✗
Work Instructions on Work Orders	✓	✗	✗	✗
Maintenance Requests from Shop Floor Terminal	✓	✗	✗	✗
Human Resources				
Schedule Management	✓	✓	✗	✓
Touchscreen Attendance	✓	✗	✗	✗
Timesheets	✓	✓	✗	✓
Breaks	✓	✓	✗	✗
Overtime	✓	✗	✗	✗
Vacation / Injury	✓	✓	✗	✗
Reporting and Forecasting				
Overall Equipment Efficiency	✓	✗	✗	✗
Work Time	✓	✓	✓	✓
Demand Forecast	✓	✓	✓	✓
Maintenance KPIs	✓	✗	✗	✗
Production Costs Analysis	✓	✓	✓	✓
Up/Downstream Traceability	✓	✓	✓	✓
Analytic Accounting	✓	✗	✓	✓
CSV Export	✓	✗ [8]	✓	✓
Dynamic Pivot Tables	✓	✗	✗ [9]	✗
Dashboards	✓	✓	✓	✓
Save Custom Reports	✓	✓	✓	✓

1-2 Inventory moves affect stock levels only.
3 As a “miscellaneous” charge on the purchase order.
4 Planned labor included as line item on the BoM.
5 No special interface exists for shop floor use. Workers could view production orders from a standard SAP interface on the shop floor.
6 Tasks like cleanup or setup which do not directly contribute to production.
7 Could be configured as production orders.
8 Conversion from ASCII or HTML and manual manipulation required.
9 Using MS Excel Connector.

Maintenance	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
Scheduling and Request Handling				
Schedule Preventive Maintenance	✓	✗	✗	✗
Maintenance Kanban	✓	✗	✗	✗
Maintenance Calendar	✓	✗	✗	✗
Shop Floor Integration	✓	✗	✗	✗
Multiple Teams / Sites	✓	✗	✗	✗
Asset Management	✓	✗	✗	✗
Subcontract Repair	✓	✗	✗	✗
Job Tracking	✓	✓	✗	✗
Parts Management				
Inventory Management	✓	✓	✓	✓
Purchasing Integration	✓	✓	✓	✓
Rotating Asset Location	✓	✗	✗	✗
Equipment Serial Numbers	✓	✗	✗	✗
Equipment Maintenance History	✓	✗	✗	✗
Dealer Portal	✓	✗	✗	✗

QMS	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
Quality Control				
At Reception	✓	✓	✗	✗
In-Process	✓	✓	✗	✗
Before Delivery	✓	✓	✗	✗
Inventory Quarentine	✓ [1]	✓	✗	✗
Quality Checks				
Quality Control Plan	✓	✓	✗	✗
Pass/Fail Checks	✓	✓	✗	✗
Measurement Checks	✓	✓	✗	✗
Quality Alerts / Nonconformance Documents	✓	✓	✗	✗
Print Nonconformance Documents	✗	✓	✗	✗
Corrective Actions	✓	✓	✗	✗
ISO9001 Tools				
Documentation Management	✓	✓	✗	✗
Customer Satisfaction Surveys	✓	✗	✗	✗
Customer Complaints Management	✓	✓	✗	✗
Traceability of Operations	✓	✓	✗	✗
Resources Management	✓	✓	✗	✗
Reports				
Nonconformance Costs	✗ [2]	✓	✗	✗

1 Requires using a custom routing.

2 Mostly included as part of the OEE report.

Product Lifecycle Management	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
Features				
Engineering Change Orders (ECOs)	✓	✓	✗	✓
BoM Version Management	✓	✓	✗	✓
Routing Version Management	✓	✓	✗	✓
MRP Integration	✓	✓	✗	✓
Centralized BoM Management	✓	✓	✗	✓
ECO Management				
Approval Workflows	✓	✓	✗	✓
BoM Version Difference Viewer	✓	✗	✗	✓
Bulk BoM Updates	✓	✗	✓	✓
Notification Mechanism	✓	✓	✗	✗
Project eMail Gateway	✓	✓	✗	✗
ECO Costing	✗	✗	✗	✓
Third-Party CAD Integrations				
AutoCAD	✗	✗	✗	✗
SolidWorks	✗	✗	✗	✗
Autodesk	✗	✗	✗	✓

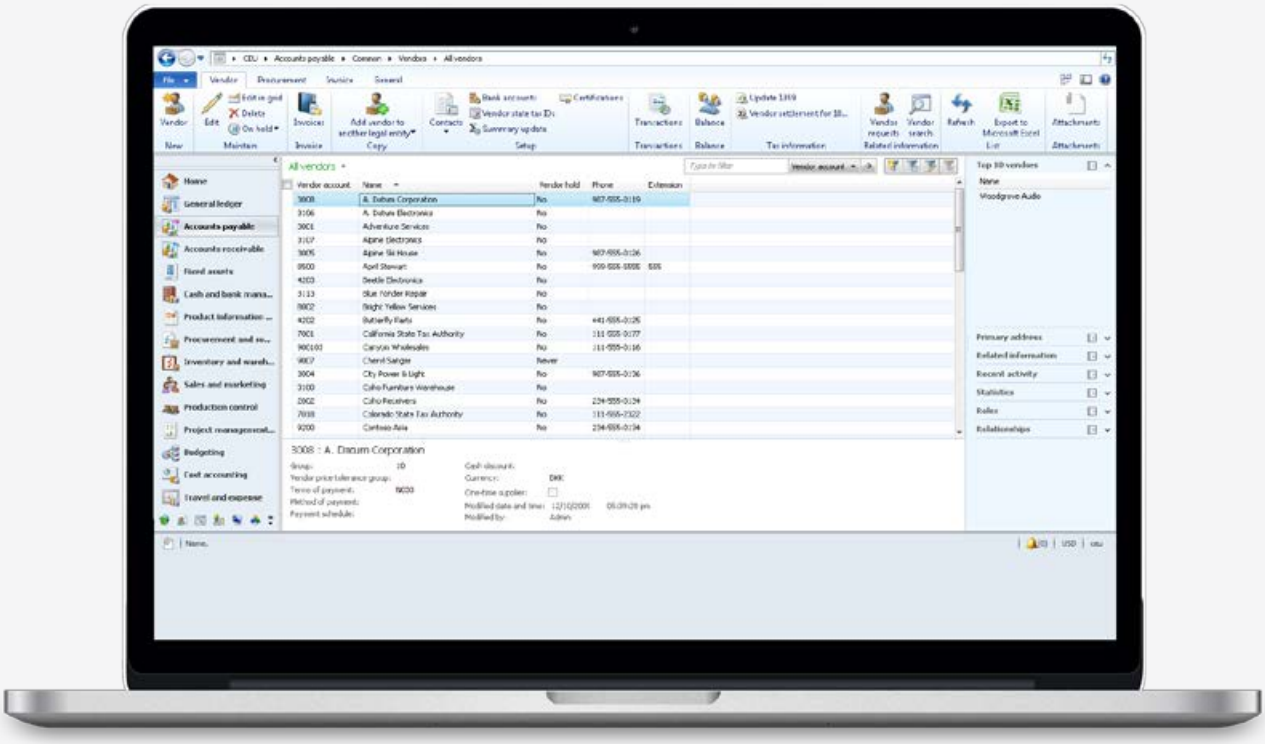
Notes on Usability

Usability, especially in enterprise software, is an often-overlooked but critically important aspect to consider during the purchasing process. Usability affects the efficiency of users working within the system, the ease with which the software can be implemented, and can reduce the costs associated with user errors. Additionally, users who spend most of their working day using the system will appreciate software that is easy to use. This is especially true for shop floor control systems, as workers there may be in a loud environment, moving quickly, wearing PPE, or otherwise not optimally situated to use a traditional computer interface with a keyboard and mouse. The special design considerations of a shop space or production line must be taken into consideration for any interface used there.

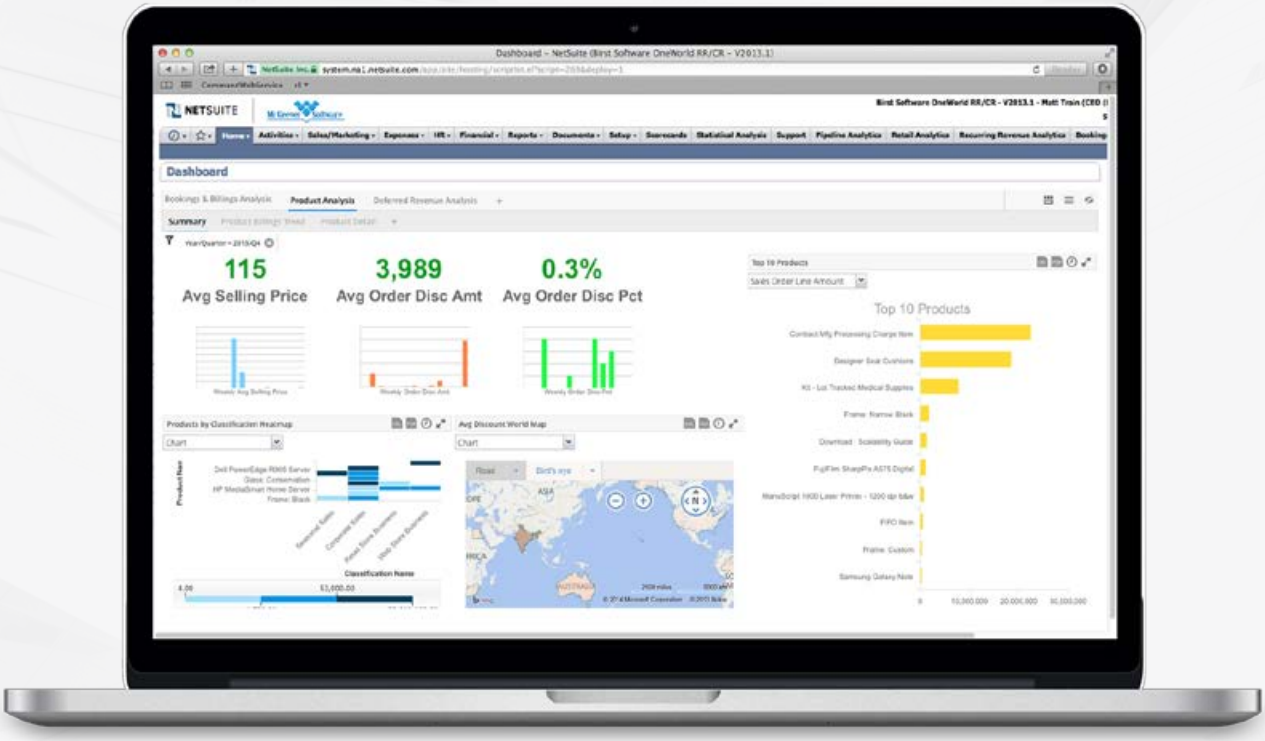
We have selected screenshots of analogous menus within each software to demonstrate the visual elements and interface options for each software in this comparison. While it is difficult to assess software usability with a static image, a rough comparison can be made. This additional information can only aid your analysis.

Dashboard - Microsoft Dynamics AX

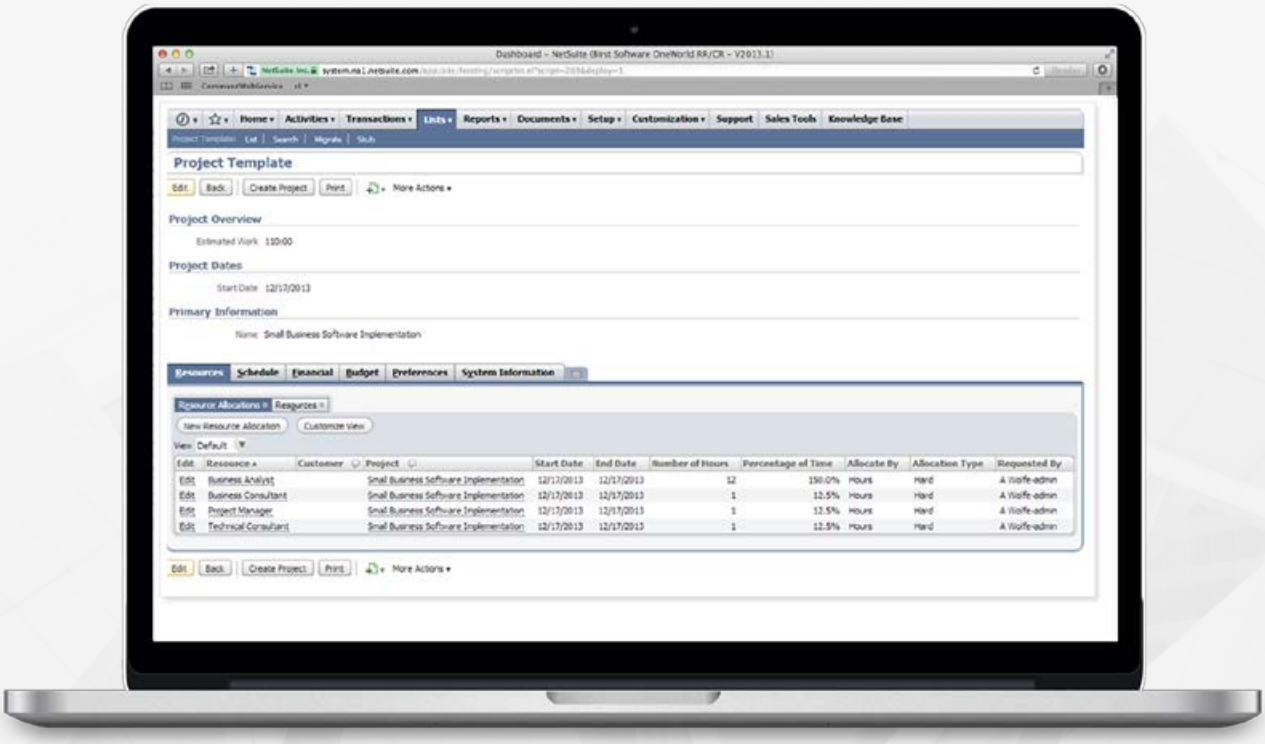
List of Vendors - Microsoft Dynamics AX



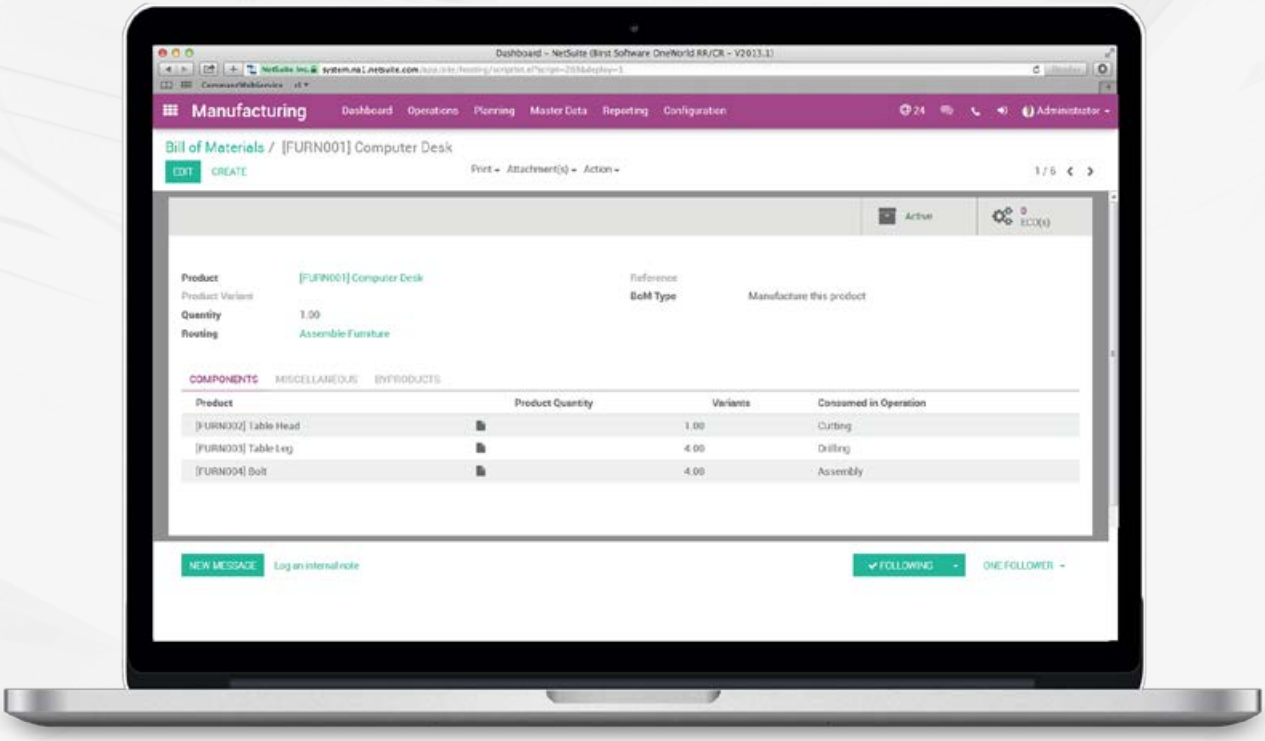
Dashboard - NetSuite



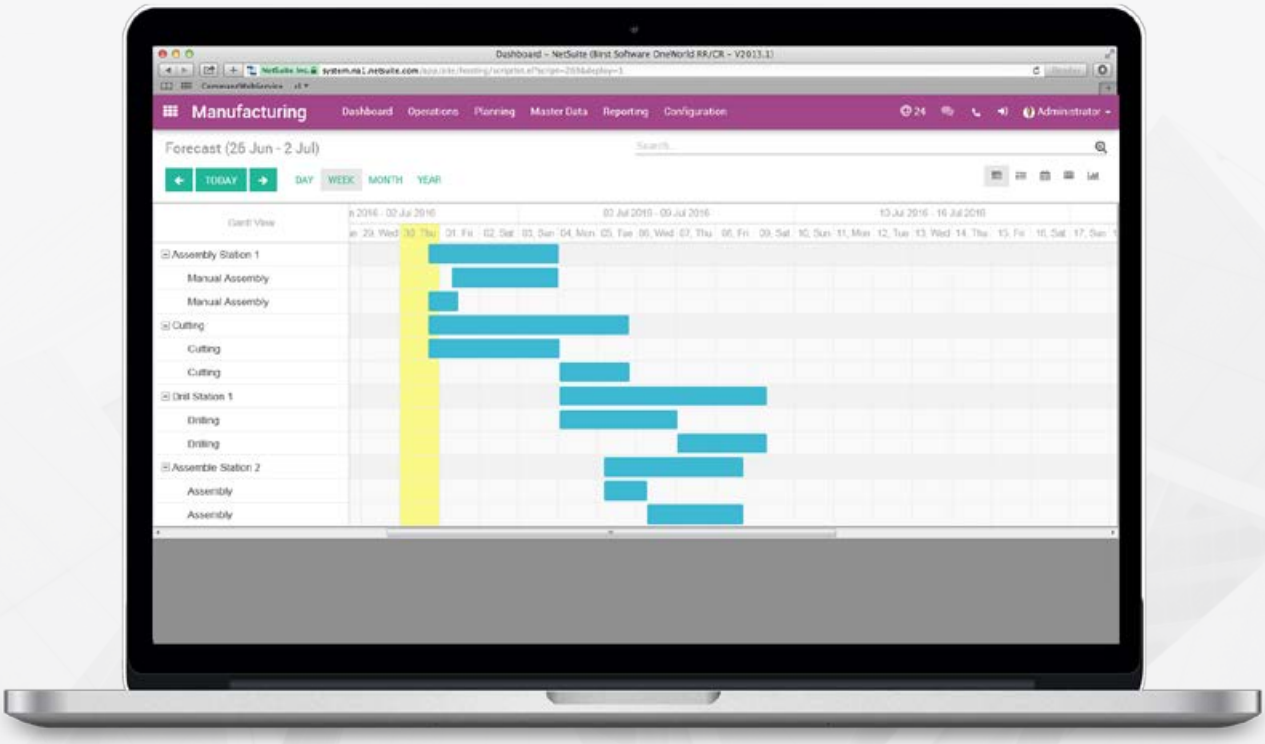
Project Planning - Netsuite



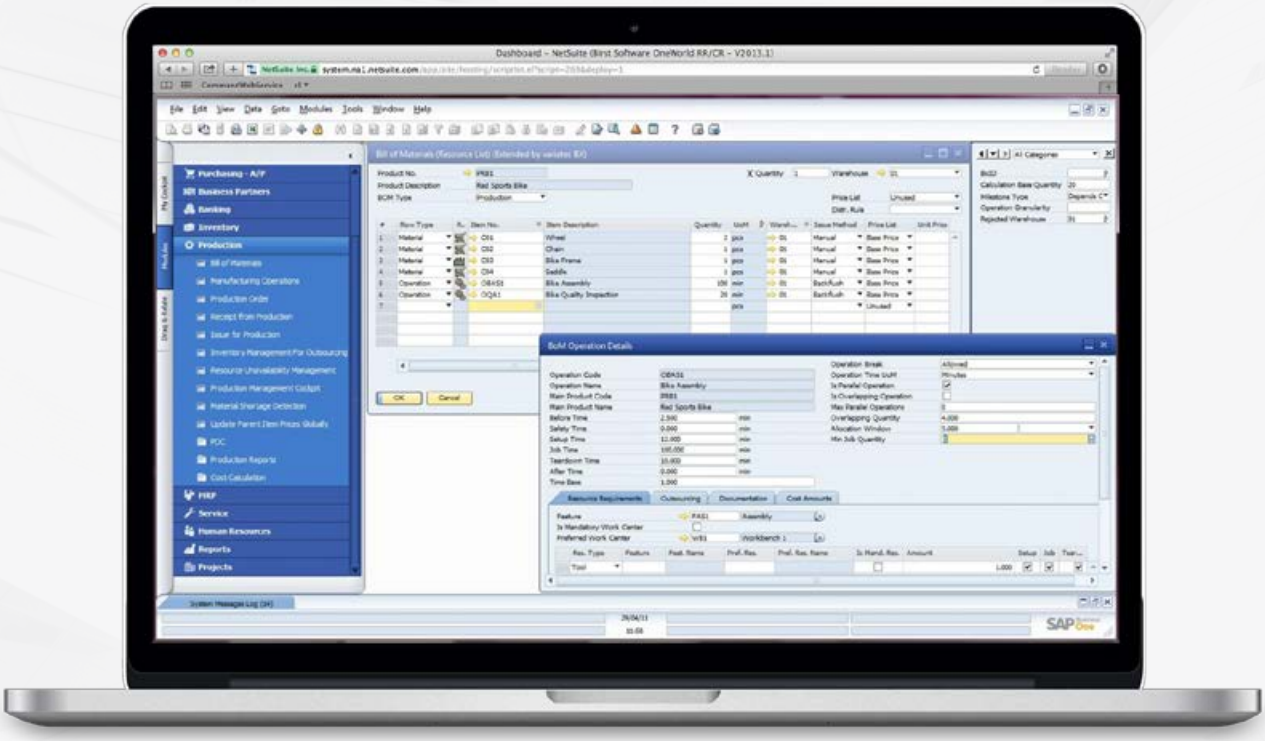
BoM - Odoo



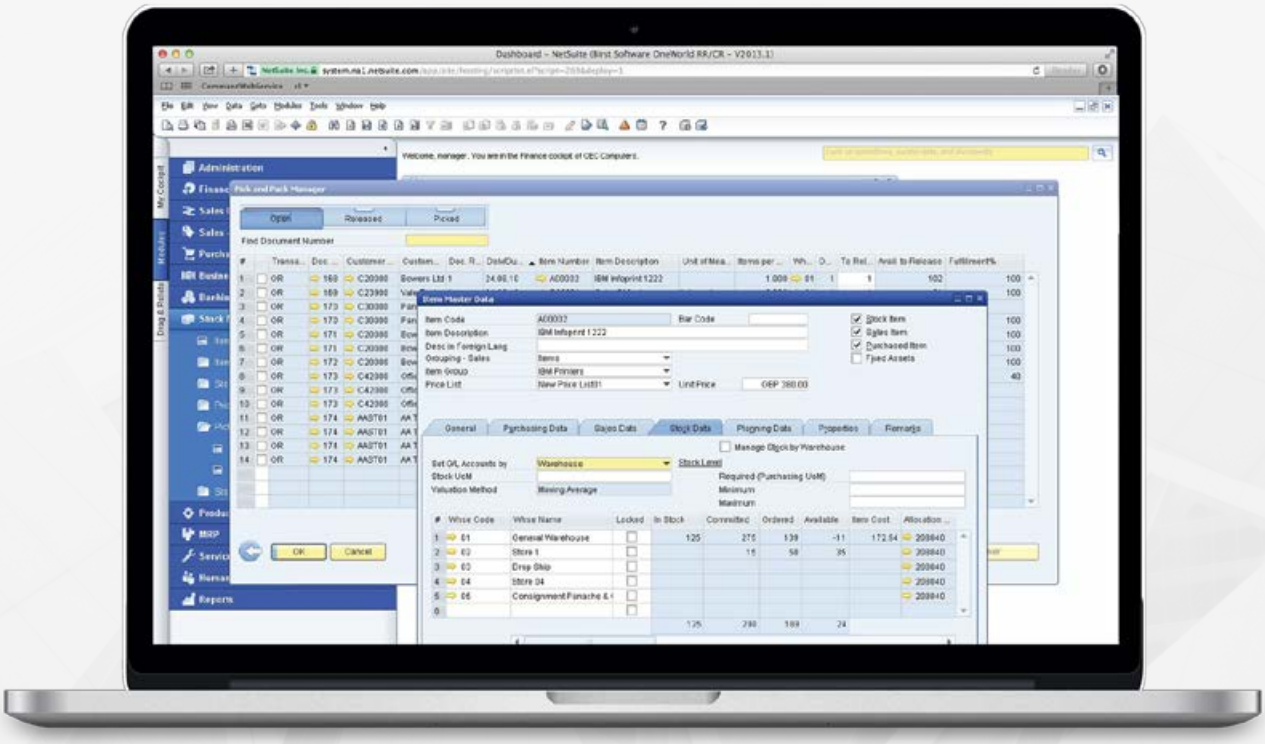
Production Scheduling - Odoo



BoM - SAP Business One



Product Master Data - SAP Business One



Usability	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
UI				
Full Web Interface	✓	✗ [1]	✗ [2]	✓
Responsive Mobile UI	✓	✗	✓	✓
Android Native App	✓	✗	✓	✓
iOS Native App	✗	✗	✓	✓
Market Place				
App Store / Add-ons	✓	✗ [3]	✗ [4]	✓
Subjective Ratings				
Ease of Use	★★★★★	★★★☆☆	★★☆☆☆	★★★★☆
Navigation and Search	★★★★★	★★★☆☆	★★★☆☆	★★★★☆
Data Entry	★★★★★	★★★★☆	★★★☆☆	★★★☆☆
Mobile App	★★★★☆	★★☆☆☆	★☆☆☆☆	★★☆☆☆
Reports Flexibility	★★★★☆	★★☆☆☆	★★★★★	★★☆☆☆

User Satisfaction	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
Ratings on g2Crowd	4.4/5	4.1/5	3.8/5	3.5/5
Ratings on GetApp	5/5	5/5 [1]	n/a	4.1/5
Ratings on Capterra	5/5	4.5/5 [2]	n/a	4.5/5
Brand Exposure	★★★☆☆	★★★★☆	★★★★★	★★★★☆

1-2 Partial web portal.

3-4 Add-ons available through value-added resellers.

5 Based on one review.

6 Average of entire MS Dynamics product line.

Pricing & Conditions

Pricing & Conditions	Odoo Enterprise V10	MS Dyn AX	SAP B1	NetSuite
Pricing [1]	$25 / user / month	$2,000 - $6,000 / user	$2,975 / user perpetual + 18% per year	$4,499 / month + $99 / user / month [2]
Contract Duration	Monthly / Annual	Perpetual	Annual	Negotiable
Five Year Cost (50 Users)	$75,000	$100,000-$300,000	$282,625	$566,940 [3]
Free Trial	✓ [4]	✗	✗ [5]	✗ [6]
New Version Upgrades Included	✓	✓	✓	✓
Update Service Included	✗	✗	✗	✓
Cloud Offer Available	✓	✓	✓	✓

1 Licensing costs only. Support, customization, and hardware not included.

2 For “manufacturing suite, 11-1,000 users”. Includes hardware and upgrades.

3 Cost of hardware is included in SaaS price.

4 Via Odoo Online free trial.

5-6 Some VARs provide free trial cloud servers.

Conclusions

Many factors must be considered when choosing a manufacturing software such as the complexity of the production workflow, the degree to which demand fluctuates, the lead times of production and procurement, the size of the organization, the growth rate of the business, the stock-keeping needs, or the complexity of the support operations in a plant. The list, as they say, goes on. You must make the decision based on your own superlative knowledge of your business while working closely with whichever vendor you choose.