Enterprise Resource Planning

1

ERP: Enterprise Resource Planning
The Business Backbone

ERP is a cross-functional enterprise backbone that integrates and automates processes within

- ✓ Manufacturing
- ✓ Logistics / Distribution
- ✓ Finance / Accounting
- ✓ Human resources
- ✓ and more…

2

ERP - Definitions

A process of ***managing all resources*** and their use in the entire enterprise ***in a coordinated manner*** - ERP software ties all departments in a company together into one common system

ERP is a set of ***integrated business applications***, or modules which ***carry out common business functions*** such as general ledger, sales forecasting….

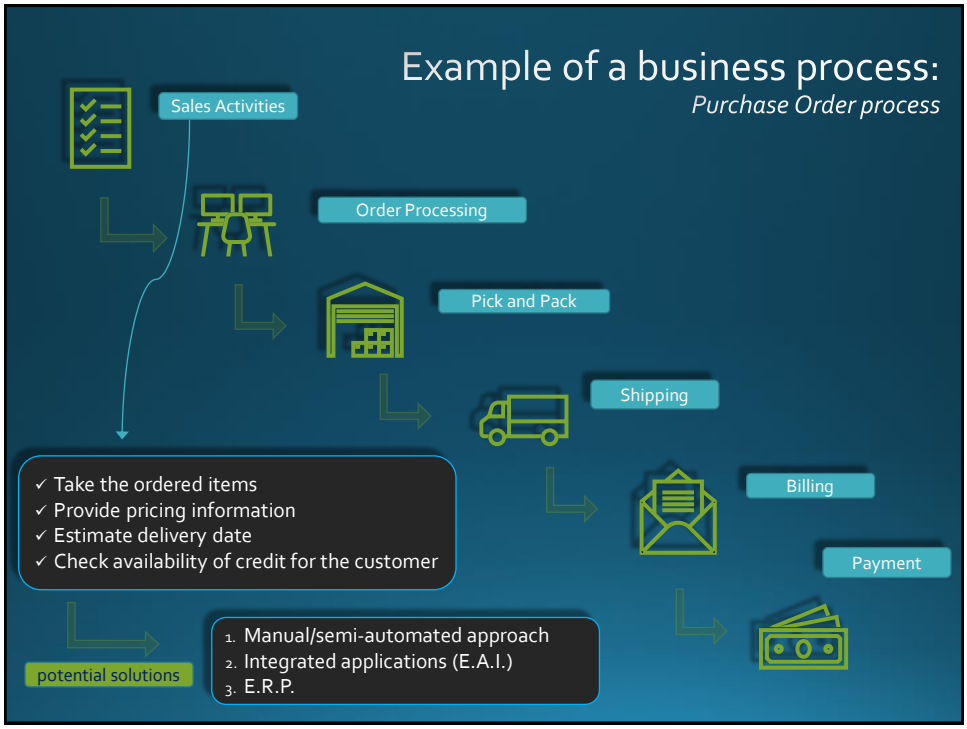
Support business through ***optimizing, maintaining, and tracking business functions***: HR, financial, manufacturing etc…

Therefore providing consistent information for timely decision-making and performance measurement

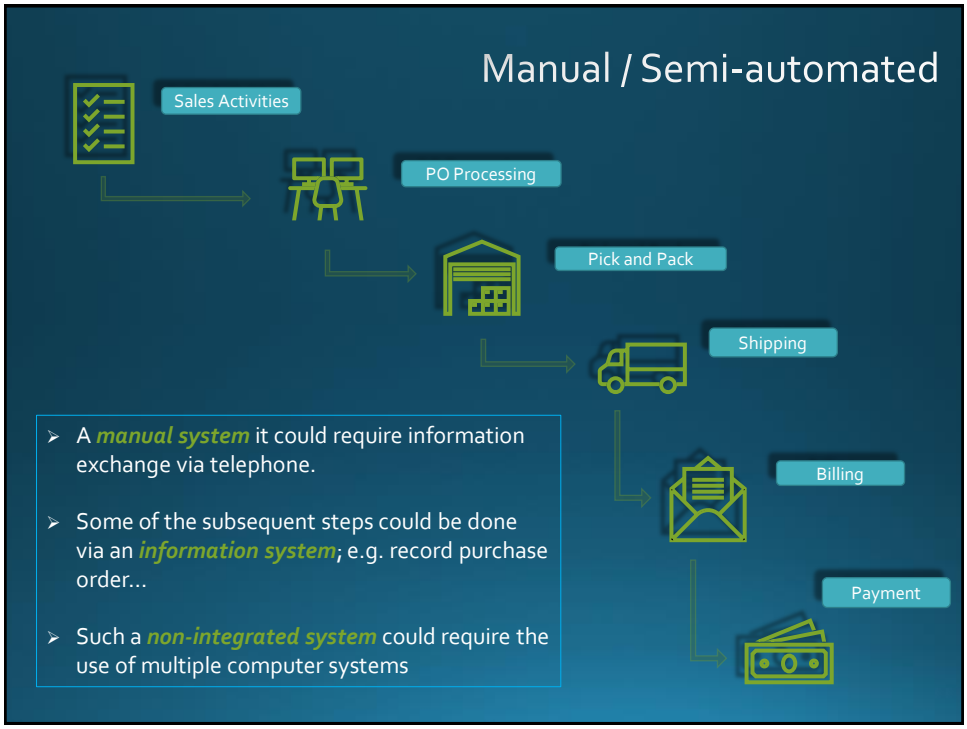
3

ERP Intro: *https://www.youtube.com/watch?v=dHIupKajJgM*

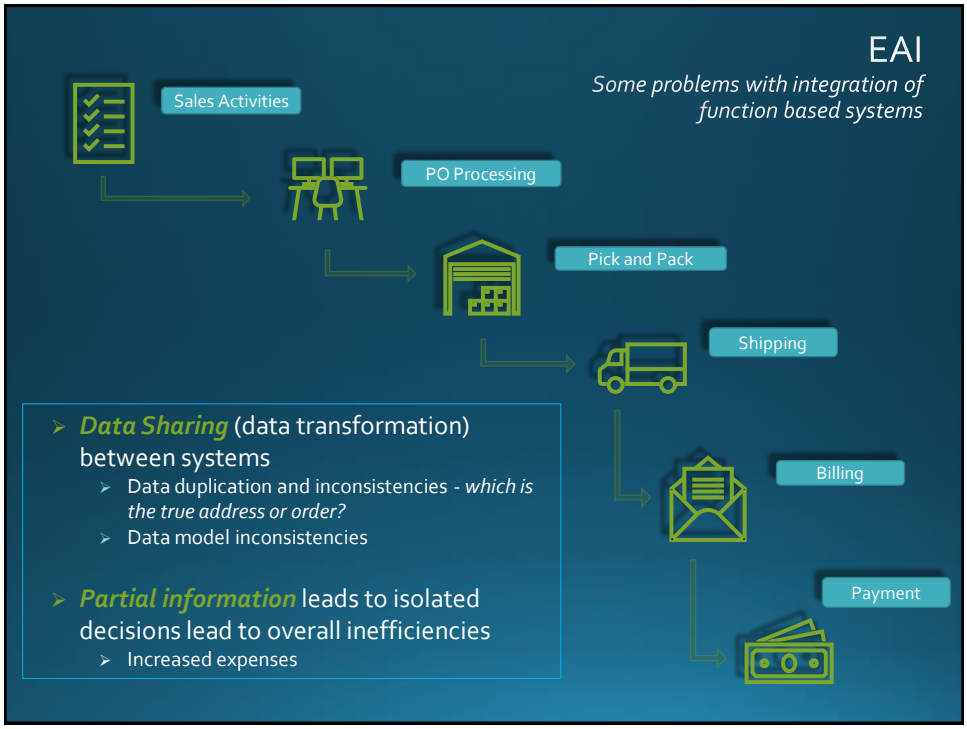
4


Example of a business process:
Purchase Order process
Sales Activities
Order Processing
Pick and Pack
Shipping
Billing
Payment
✓ Take the ordered items
✓ Provide pricing information
✓ Estimate delivery date
✓ Check availability of credit for the customer
potential solutions
1. Manual/semi-automated approach
2. Integrated applications (E.A.I.)
3. E.R.P.

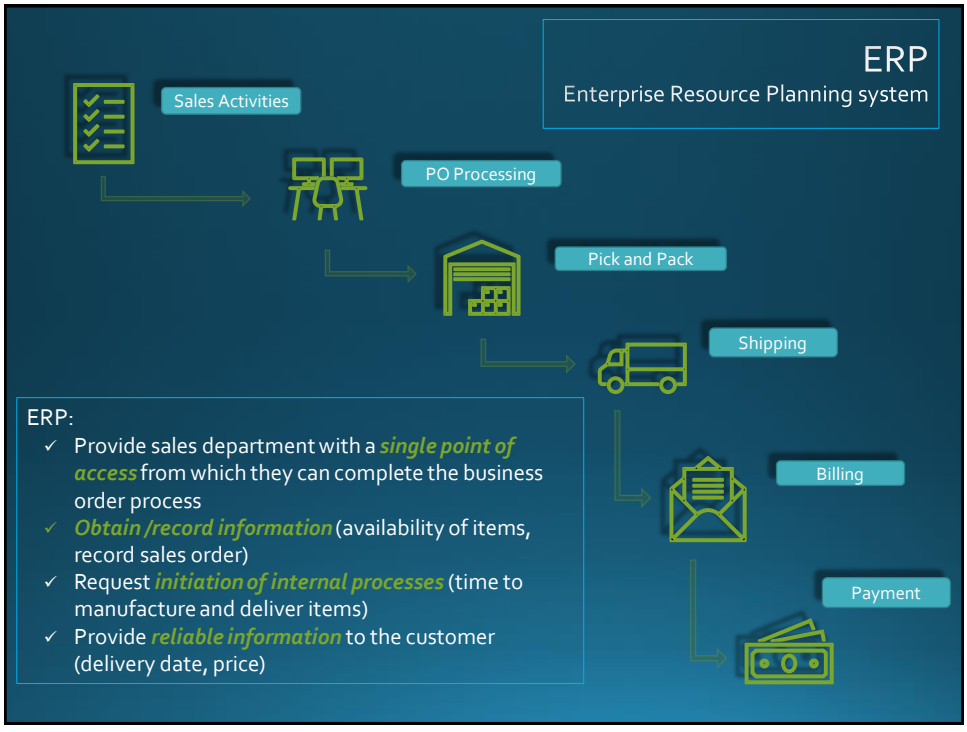
6


Manual / Semi-automated
Sales Activities
PO Processing
Pick and Pack
Shipping
Billing
Payment
A manual system it could require information exchange via telephone.
Some of the subsequent steps could be done via an information system; e.g. record purchase order…
Such a non-integrated system could require the use of multiple computer systems

7


EAI
Some problems with integration of function based systems
Sales Activities
PO Processing
Pick and Pack
Shipping
Billing
Payment
Data Sharing (data transformation) between systems
Data duplication and inconsistencies - which is the true address or order?
Data model inconsistencies
Partial information leads to isolated decisions lead to overall inefficiencies
Increased expenses

8

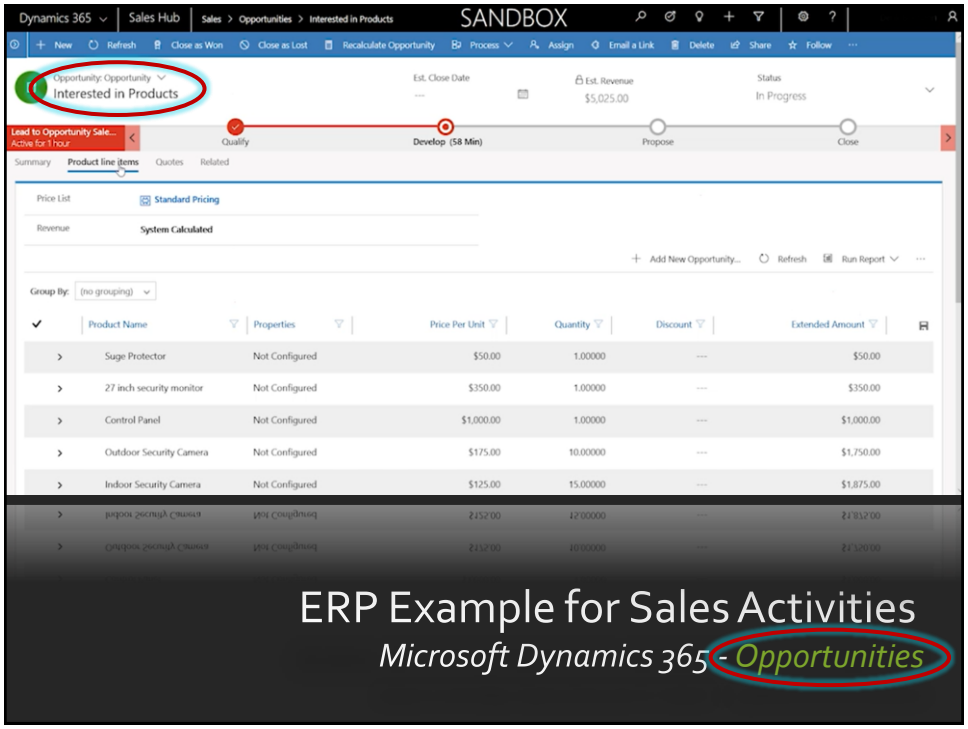

ERP
Enterprise Resource Planning system
Sales Activities
PO Processing
Pick and Pack
Shipping
Billing
Payment
ERP:
Provide sales department with a single point of access from which they can complete the business order process
Obtain /record information (availability of items, record sales order)
Request initiation of internal processes (time to manufacture and deliver items)
Provide reliable information to the customer (delivery date, price)

9

Microsoft Dynamics™

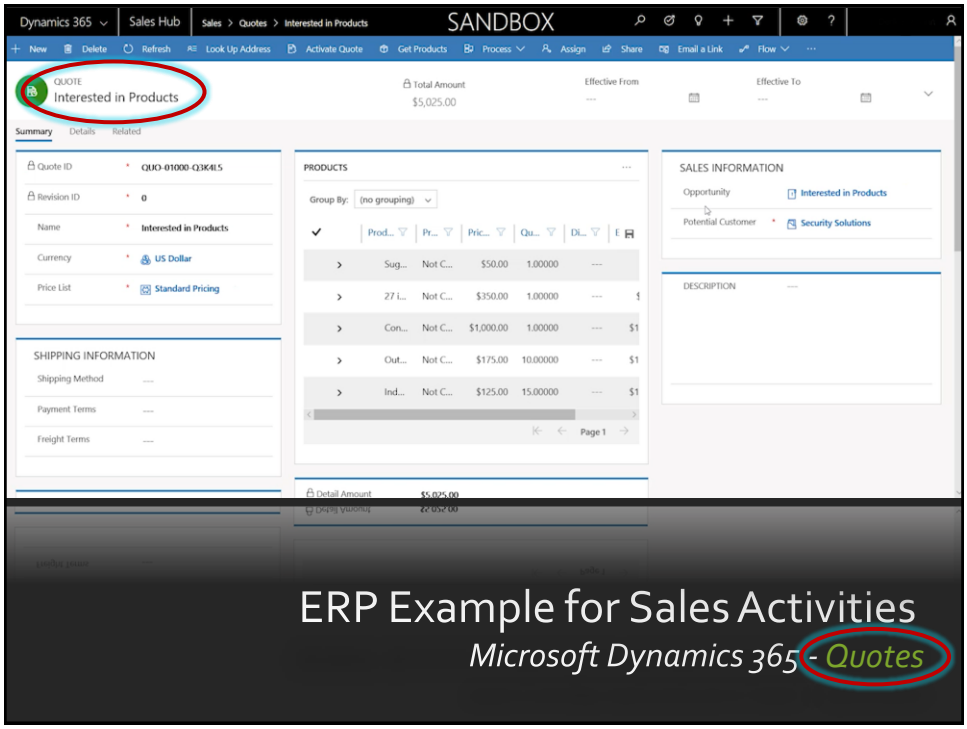
Example Functionality
Microsoft Dynamics 365
Progressing a Lead from an Opportunity to an Order

10

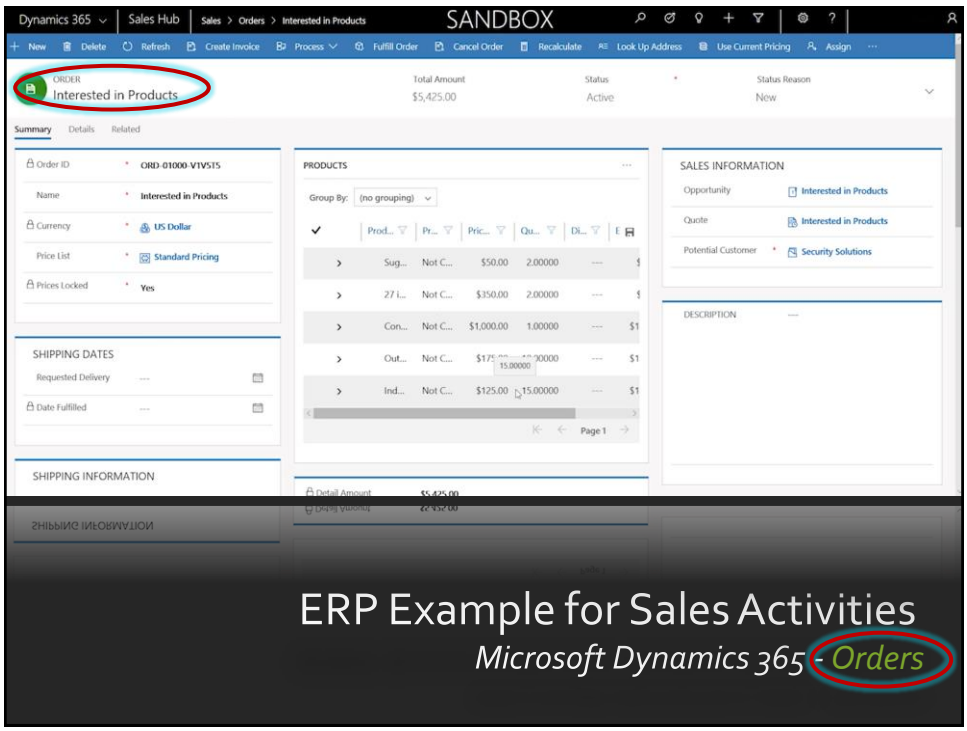


ERP Example for Sales Activities
Microsoft Dynamics 365 - Opportunities

11


Dynamics 365
Sales Hub
Sales > Quotes > Interested in Products
SANDBOX
QUOTE
Interested in Products
Total Amount
$5,025.00
Effective From
Effective To
Summary
Details
Related
Quote ID
QUO-01000-Q3R4L5
Revision ID
0
Name
Interested in Products
Currency
US Dollar
Price List
Standard Pricing
PRODUCTS
Group By:
(no grouping)
SALES INFORMATION
Opportunity
Interested in Products
Potential Customer
Security Solutions
DESCRIPTION
SHIPPING INFORMATION
Shipping Method
Payment Terms
Freight Terms
Page 1
ERP Example for Sales Activities
Microsoft Dynamics 365 - Quotes

12


Dynamics 365
Sales Hub
Sales > Orders > Interested in Products
SANDBOX
ORDER
Interested in Products
Total Amount
$5,425.00
Status
Active
Status Reason
New
Summary
Details
Related
Order ID
ORD-01000-V1V5T5
Name
Interested in Products
Currency
US Dollar
Price List
Standard Pricing
Prices Locked
Yes
PRODUCTS
Group By:
(no grouping)
SALES INFORMATION
Opportunity
Interested in Products
Quote
Interested in Products
Potential Customer
Security Solutions
DESCRIPTION
SHIPPING DATES
Requested Delivery
Date Fulfilled
SHIPPING INFORMATION
Page 1
ERP Example for Sales Activities
Microsoft Dynamics 365 - Orders

13

Enterprise Resource Planning

- A process of ***managing*** all ***resources*** and their use in the entire enterprise in a coordinated manner
- ERP is a ***set of integrated business applications***, or modules which carry out common business functions such as general ledger, sales forecasting….
- ***Support*** business through ***optimizing, maintaining, and tracking*** business functions suchas HR, financial, manufacturing etc…

- Focused on ***value chains***, rather than individual functions
- More about ***business process change*** than technology

ERP core capabilities include:
- *Integrated modules*
- *Common process and data models and definitions*
- *Common database - update one module, automatically updates others*

14

Benefits of ERP

- ✓ Common set of ***data***
  - ✓ Removes consistency and synchronisation issues
- ✓ Library of available ***standard template processes*** and modules make integration easier
- ✓ Inter-department ***integration for all departments*** using the ERP
  - ✓ Allow companies to ***better understand*** their business.
  - ✓ Helps companies ***standardise business processes*** and more easily enact best practices.
  - ✓ More ***efficient processes*** enable companies to concentrate their efforts on serving their customers, maximizing profit, and building a competitive advantage.

15

Potential Limitations of ERP

- ✓ Global ERP ***can be a never-ending project*** for large organisations
- ✓ No organisation exists in isolation - ***value chain business processes***
  - ✓ There are always suppliers and clients who use ***different data models***.
  - ✓ This means that the ***need for integration*** cannot be removed.
- ✓ Inter-department integration relies on using the global ERP
  - ✓ Causes problems with anomalous departments, recently required, geographically isolated or with different business processes.
- ✓ The ***software can drive the business*** rather than the other way around
  - ✓ Templates tend to ***impose the standard business process*** rather than your organisation's business process. This is okay for commoditised processes but not for all.

16

ERP Modules

17

The "modular" ERP System

- Most ***systems are modular*** to ***permit automating some functions*** but not others.
- Some ***common modules***, such as finance and accounting, are adopted by nearly all users; others such as human resource management are not.
- For example, ***a service company probably has no need for a manufacturing*** module.
- Other companies ***may already have a system*** that they believe to be adequate. Generally speaking, the ***greater the number of modules selected, the greater the integration benefits***, but also the greater the costs, risks and changes involved.

18

Decision making modules: Technology to **integrate people, information and business processes** across technologies; e.g. information integration in a data warehouse

Operations: All **value chain processes** - purchasing, production, sales.

Elements of ERP

19

Finance module

The financial module is the ***core of many ERP software systems***.

All kind of organizations (small scale, large scale) benefit from the implementation of an ERP financial module.

It can ***gather financial data from various functional departments***, and generates valuable financial reports such:

- general ledger / balance sheet
- quarterly financial statements

20

Human Resource module

Human Resources is another ***widely implemented ERP module***.

HR ***module streamlines the management of human resources*** and human capitals. HR modules routinely maintain a complete employee database including:

- contact information
- salary details
- attendance
- performance evaluation
- and promotion of all employee.

21

Purchasing module

Purchase module ***streamlines procurement*** of required raw materials.

It ***automates*** the processes of:
- identifying potential suppliers
- negotiating price
- awarding purchase order to the supplier
- billing processes

Purchase module is ***tightly integrated*** with the *inventory control* and *production planning* modules

The purchasing module is often ***integrated with supply chain management*** software (see next lecture).

22

Sales and Marketing module

Sales module implements functions:
- order placement
- order scheduling
- shipping and invoicing (in conjunction with other modules).

Sales module is closely integrated with organizations' *ecommerce websites*.

Many ERP vendors offer online store front as part of the sales module.

ERP *marketing module* along with *Customer relations management (CRM)* software (see next lecture) supports:
- lead generation
- direct mailing campaign and other marketing works
- scheduling of the promotions

23

Other Technologies

We will revisit these later…

Artificial Intelligence (Machine Learning)

- Predictive Analytics & Data Analysis / Mining
- Learns from the business data (*e.g. what is normal?*)
- Support & Automate Decision Making (*e.g. Accounts Payable*)
- Needs good/clean data

Blockchain

- Creating, encrypting, validating, and distributing valuable and unchangeable records, transactions or data
- A distributed ledger

IOT (Internet Of Things)

- "Things" - embedded with sensors, software, and other technologies for connecting and exchanging data with other devices and systems over the internet
- Over 20 billion devices predicted by 2025
- Enterprise use cases – Connected buildings, Asset Tracking, Security, Customer Experience, Event Triggering *(e.g. invoke business processes – AT&T's button – no wifi / bluetooth)*

24

Different ERP Implementation Approaches / Options

- **Complete system.**
  - Create IT architecture ***from scratch***
    - Uncommon as there are few new companies which start off large (or organised) enough to implement ERP
- **ERP by Process**
  - Deploy ***one or a few ERP modules*** across all Business Units
  - Risk: May never extend beyond original process.
- **ERP by Business Unit**
  - Deploy fully integrated ERP suite in ***one or more Business Units***
  - Risk: May never extend beyond original function.
- **Fully Integrated (with current Enterprise architecture) ERP**
  - ***Full scale deployment*** across the enterprise
  - Risk: Very expensive and could take a long time before getting a return
- **An enterprise needs to identify and plan the delivery models for any of the above – On premise or Cloud services and all the options in between**

25

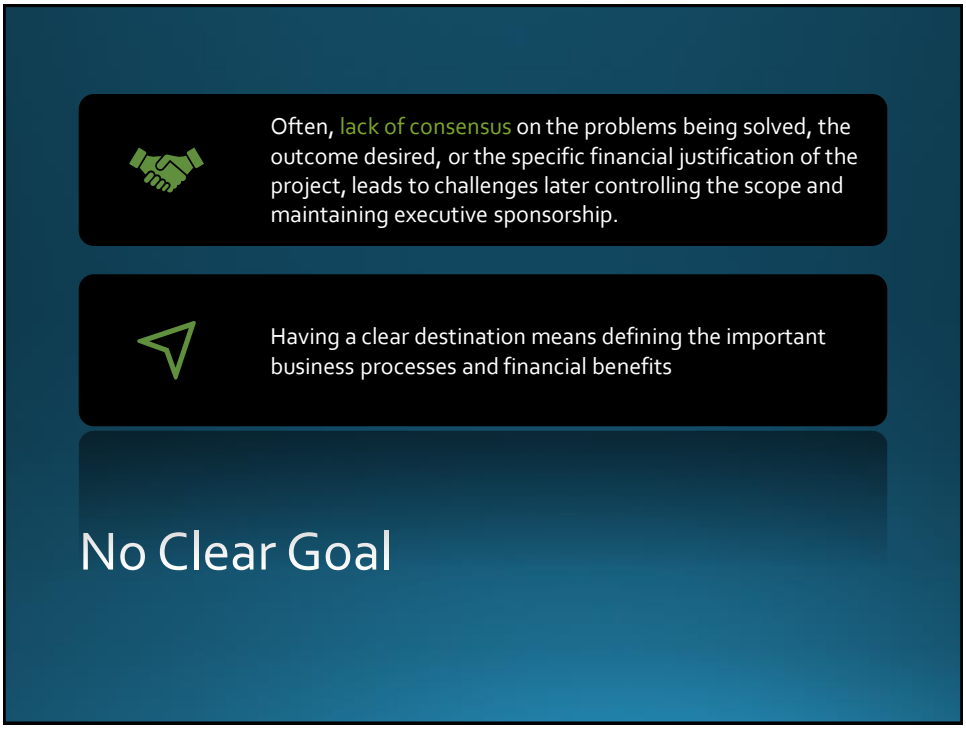
ERP *Implementation Risk Factors*

26

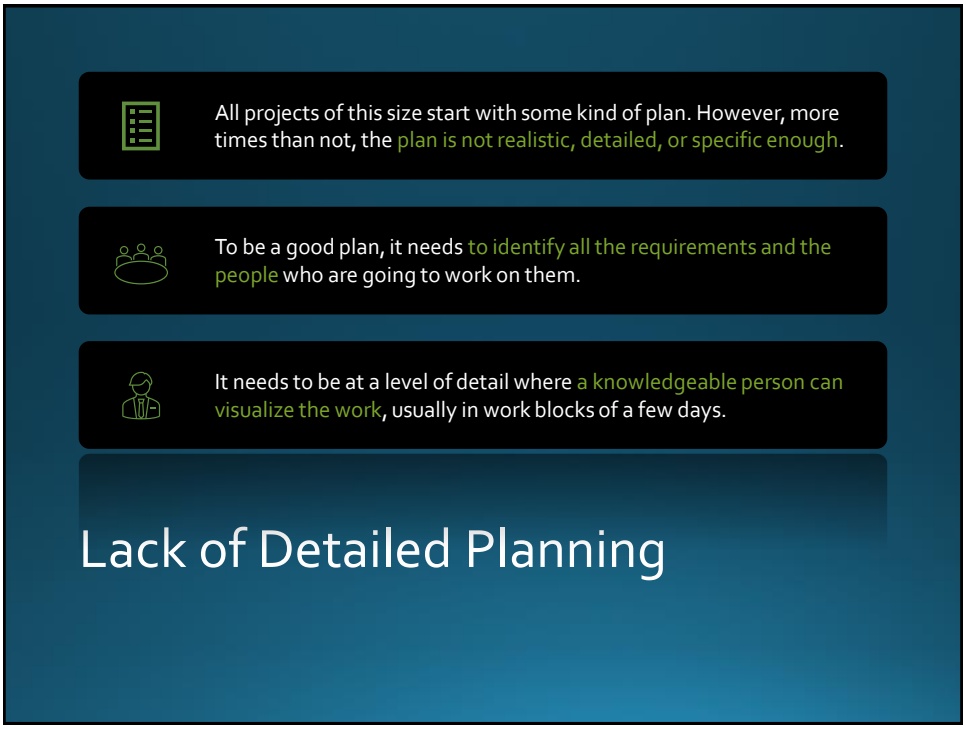
Implementation Risk Factors

- No clear goal
- Lack of clear planning
- Under-estimating resources required
- Customisations
- Insufficient testing

27


Often, lack of consensus on the problems being solved, the outcome desired, or the specific financial justification of the project, leads to challenges later controlling the scope and maintaining executive sponsorship.
Having a clear destination means defining the important business processes and financial benefits
No Clear Goal

28


All projects of this size start with some kind of plan. However, more times than not, the plan is not realistic, detailed, or specific enough.
To be a good plan, it needs to identify all the requirements and the people who are going to work on them.
It needs to be at a level of detail where a knowledgeable person can visualize the work, usually in work blocks of a few days.
Lack of Detailed Planning

29

Having a solid understanding of the internal and external resources needed to complete the project is critical. E.g.:

For internal resources, understanding the time commitment needed from business users, typically in the Finance, Accounting, or Human Resources departments, is one of the most commonly underestimated areas.

For external resources, having an agreement up-front with your consultants and contractors about the specific duration, skills, and quantity of resources needed is critical.

Under-Estimating Resources Required

30

Customisations, along with interfaces and data conversion, are the main areas of technical risk in ERP implementations.

Customizations always start out small, but incrementally grow to become the technical challenges that derail these projects.

Customisations

31

When schedules get tight, reducing the number and depth of test cycles is often one of the first areas that often gets cut.

The purpose of testing in an ERP project is not to see if the software works. **The purpose is to see if the system meets your business needs and produces the output you need.**

Reducing testing may not leave defects undiscovered, but it certainly **increases the risk the ERP system will be missing important functions or not be well accepted by end users**.

Insufficient testing

32

ERP

Have a look at this from Eric Kimberling…

https://www.youtube.com/watch?v=9x6yOwR7lSk

33