



Business Information System 2 - ERP

April 2023

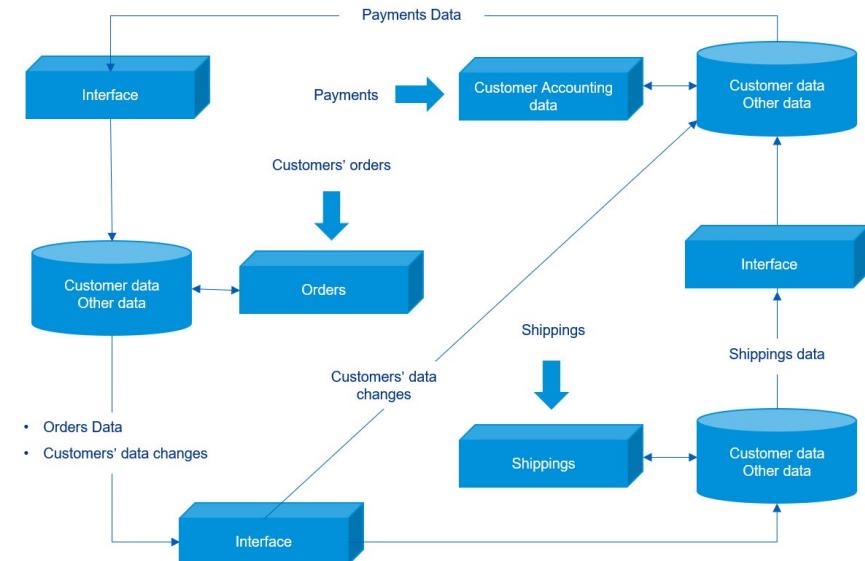
Agenda

1. From Legacy systems to ERP systems (historical evolution)
2. How ERP systems are made (levels, environment)
3. The introduction of an ERP system in the company
4. SAP: sample of ERP system
5. ERP Projects
6. Recommended Approach
7. Discussion

What Legacy systems are

- They are created as **successive layers of autonomous applications**, each of which covers the IT needs of different organizational units.
- Each Legacy application has its **own Database**
- They can be connected to each other through **interfaces**.
- They are developed in a "custom" way, i.e. they are built through an extensive use of **software programming activities**.
- They are **technologically underdeveloped** and therefore based on Mainframe or Host technologies and characterized by character-based interface.
- They are not always characterized from relational Data Base.

Sample of data flow



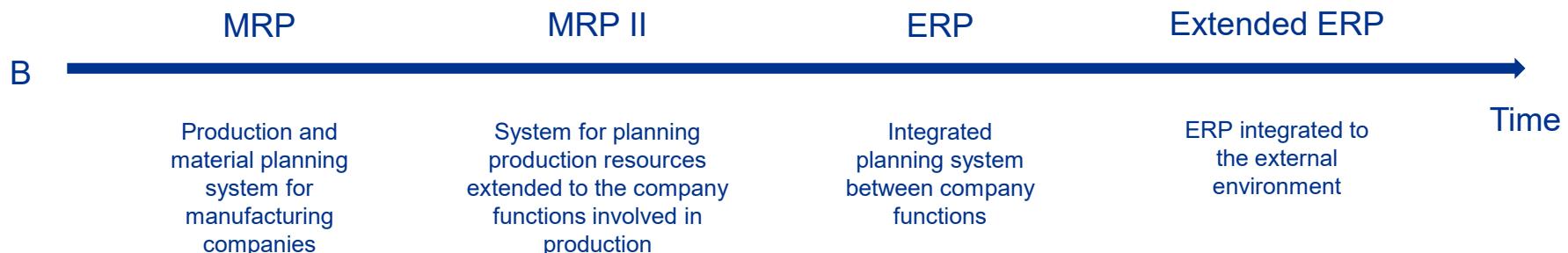
Legacy and the evolution from MRP to ERP

Legacy systems are softwares usually developed in-house which allow the registration of all the operational activities of the corporate functions.

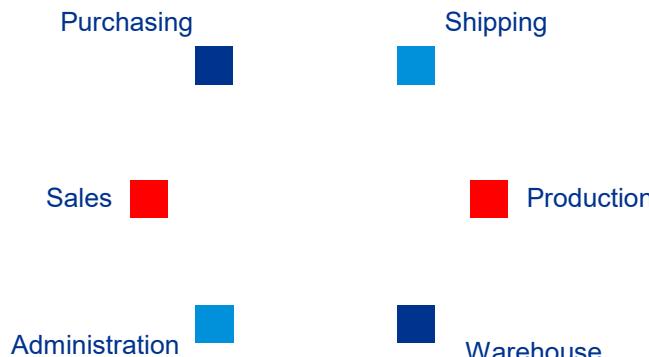


ERP Systems are the extension of **MRP (Material Requirement Planning)** and MRP II (Manufacturing Requirement Planning).

MRP Systems were born to rationalize the use of materials in factories and were transformed first into **MRP II** which were able to control the entire production activity, and finally into **ERP** with the addition of administrative, management and financial functions.

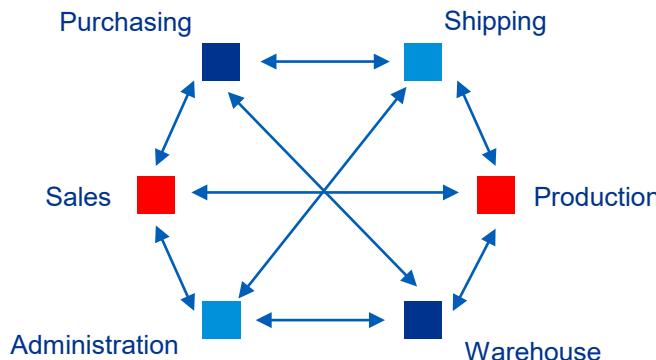


Legacy System vs ERP (1/2)



Legacy: closed systems

- Ex-post records of information about past actions.
- Use of non-shared repositories, duplication of activities.
- Heterogeneity of operating methods across business functions.



ERP: internal integration

- Systems that can perform simulations and make proposals on future actions.
- Sharing the same archives and information.
- Sharing of the same operational logic among the various company functions.

Legacy System vs ERP (2/2)

Legacy Systems

- Ex-post information recording on past actions.
- Development of programs for individual functions.
- Programs developed in-house.
- Use of non-shared repositories, duplication of activities.
- Heterogeneity of operating methods across business functions.
- The activities carried out in one functional area do not affect other functions.

ERP Systems

- Systems that perform simulations and make proposals on future actions.
- Development of programs for processes shared between multiple functions.
- External supplier packages.
- Sharing of the same operational logic across business functions.
- Open systems that allow integration with external applications.
- Close interconnection of activities carried out in the various functional areas.

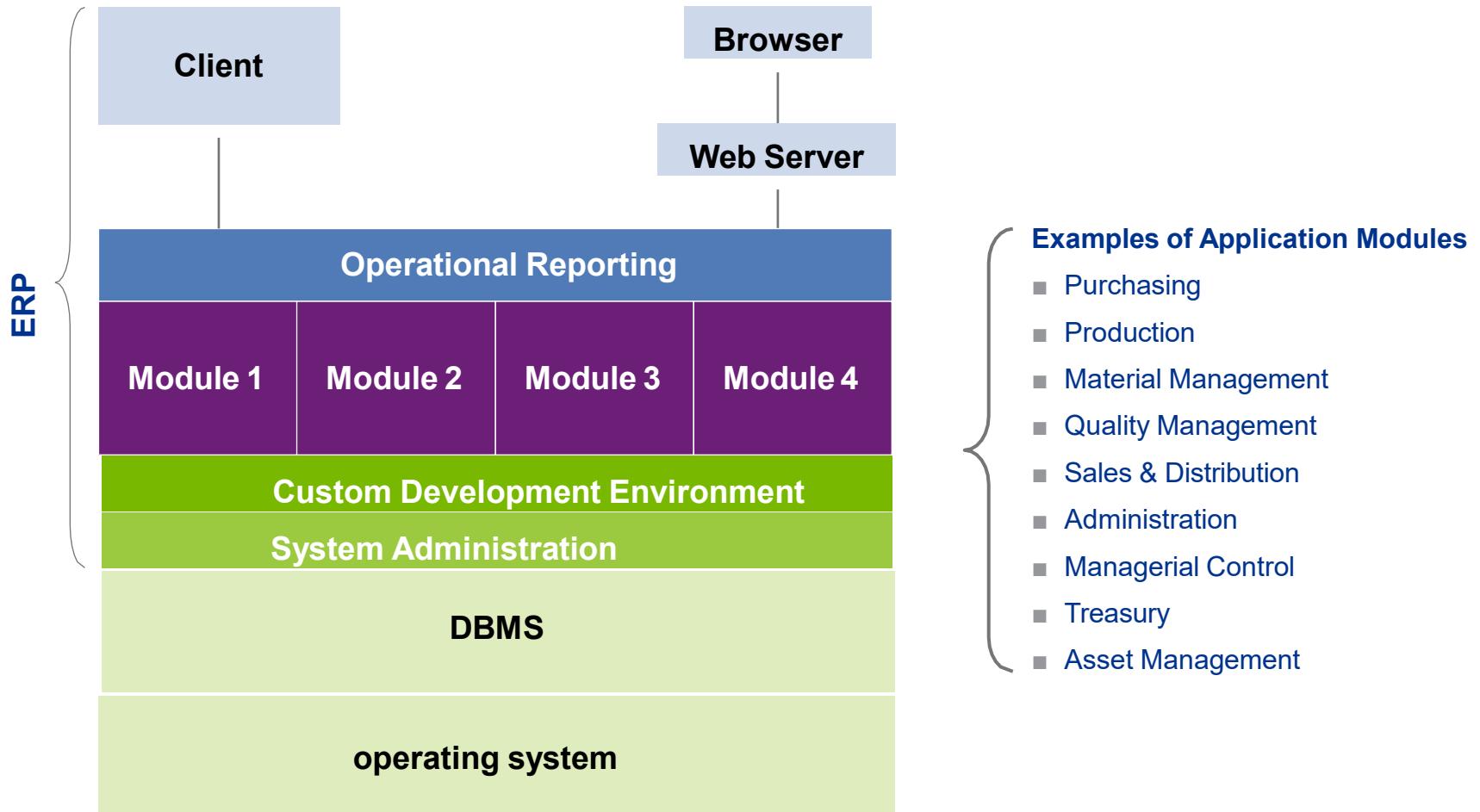
Agenda

1. From Legacy systems to ERP systems (historical evolution)
2. **How ERP systems are made (levels, environment)**
3. The introduction of an ERP system in the company
4. SAP: sample of ERP system
5. ERP Projects
6. Recommended Approach
7. Discussion

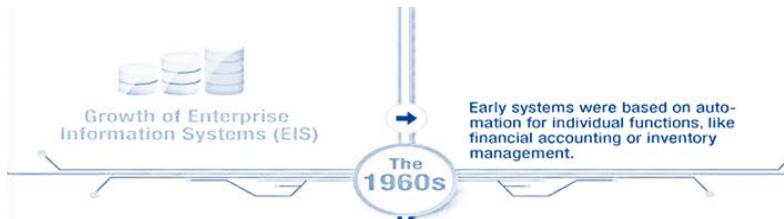
ERP systems features

- They cover the **main business processes** (logistics, accounting, production, human resources) through a set of application elements called "modules" or "granules";
- They guarantee the **uniqueness of the data** and therefore the univocity of business information, thanks to the fact that transactions update online the data managed by all business functions;
- They are produced by the **major software houses** that develop them according to the requirements of pilot customers and update them continuously according to technological, regulatory or best practice evolutions;
- **Controlled** data management and **uniqueness** imply that data cannot be modified directly but through "transfers";
- They are characterized by **relational DB**;
- They are characterized by a **Client/Server architecture**;
- Although they do not cover all Core Business processes, **vertical solutions by industry** are available for the main ERPs;
- They bring into the company a set of processes referred to best practices, without having to "reinvent the wheel".

The logical architecture of an ERP system

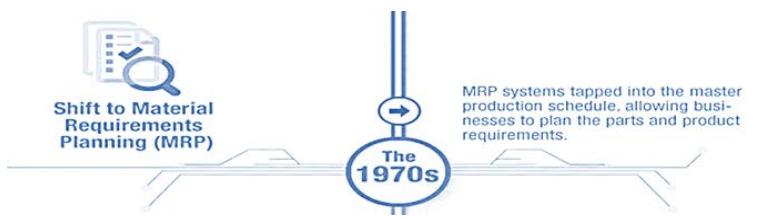


History of ERP systems (1/2)



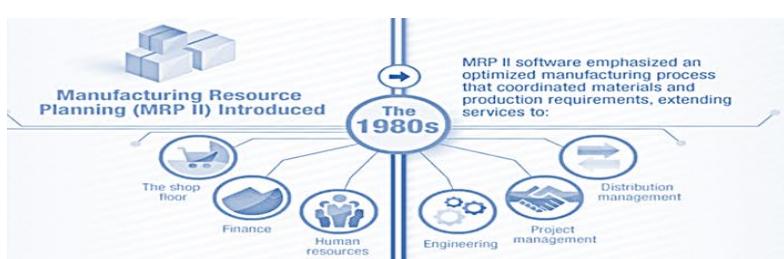
ENTERPRISE INFORMATION SYSTEMS (EIS)

- The first business information systems are created and developed.
- Systems with the objective of managing individual business functions, typically general accounting and warehousing, become widespread.

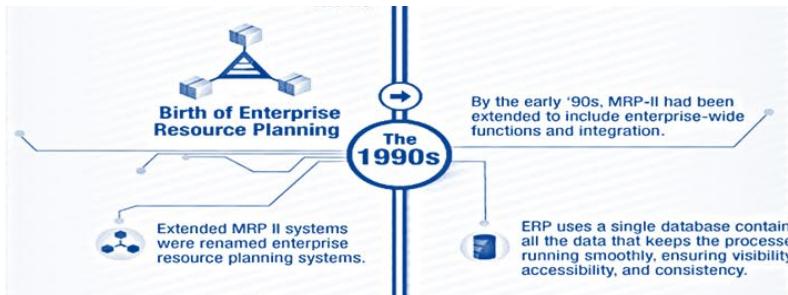


MATERIAL REQUIREMENT PLANNING (MRP I e II)

- Business systems are evolving into applications for production process planning.
- MRP planning generates the purchase requirements of raw materials taking into account different elements in an **integrated** way (production requirements of finished products, to the structure of the production system, inventory levels the sizing of the lot for each operation, etc).
- MRP II systems have set themselves the goal of **optimizing the entire plant production system** by supporting capacity planning, shop floor control and distribution management activities.



History of ERP systems (2/2)



ENTERPRISE RESOURCE PLANNING (ERP)

- In the early 1990s, the MRP-II application model was further expanded to cover functional areas such as engineering, finance, human resources, sales and project management - in other words, the full range of activities within any company.



The present and the future...(1/2)



ESTENDED ENTERPRISE RESOURCE PLANNING (ERP)

- Customer Relationship Management (**CRM**)
- Supply chain management (**SRM**)
- Advanced management of **planning** and scheduling processes

The new ERP platforms are developed consistent with current paradigms regarding:



Cloud Computing



Remote usability Mobility



Leveraging the processing capabilities of large volumes of data Analytics (Process Mining)



Extension of the Internet to the world of concrete objects and places (IOT Internet of Things)

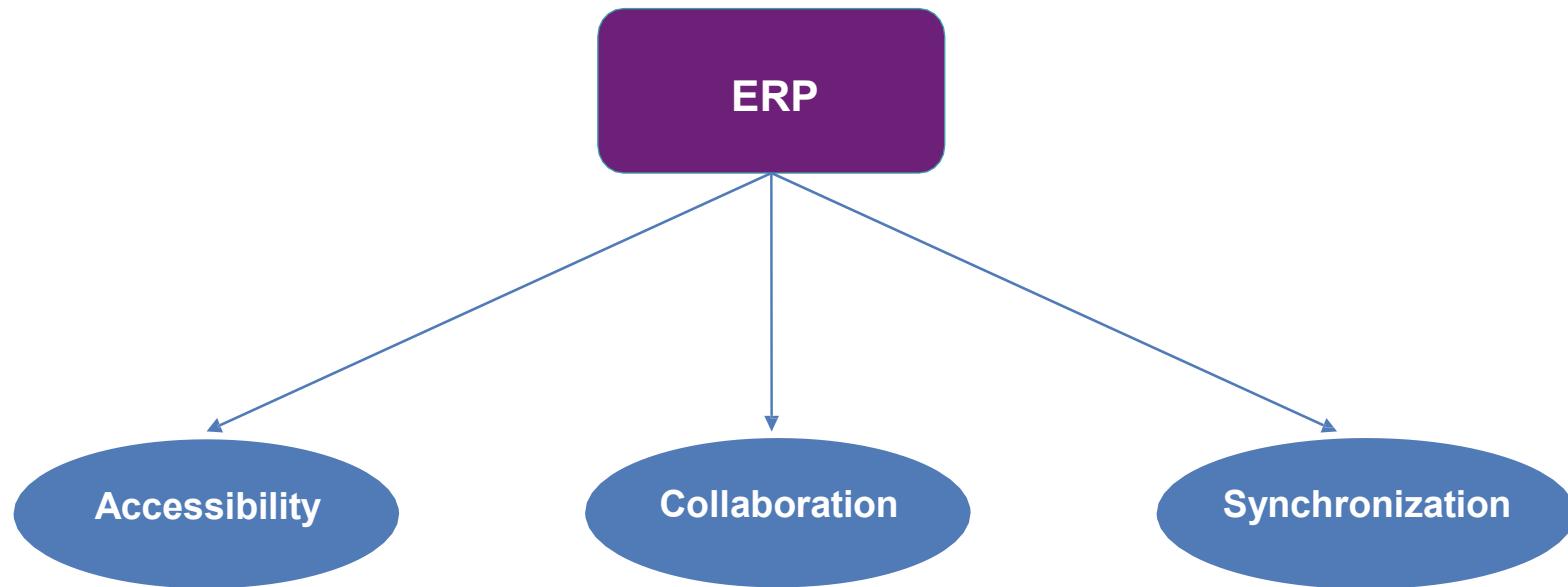


The present and the future...(2/2)

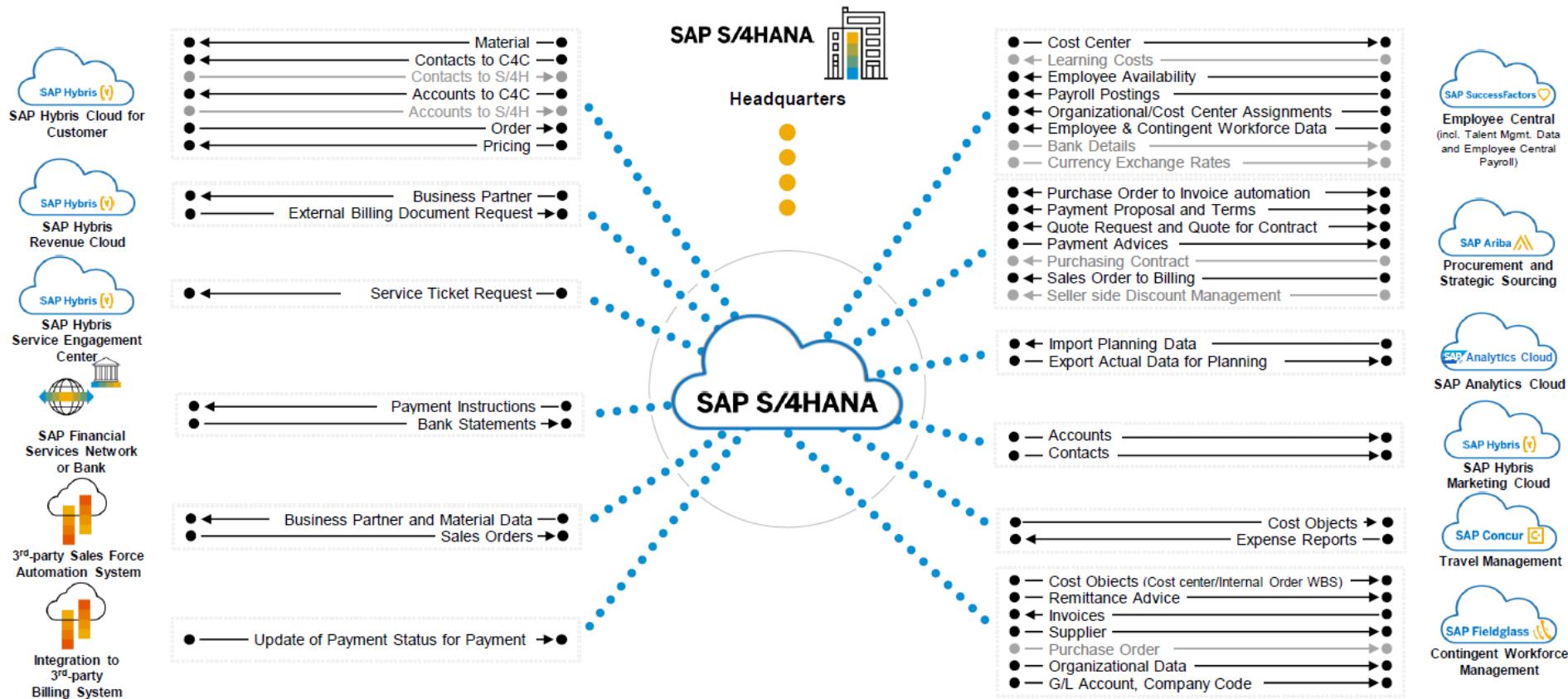


ERP systems evolution: Extended ERP (1/3)

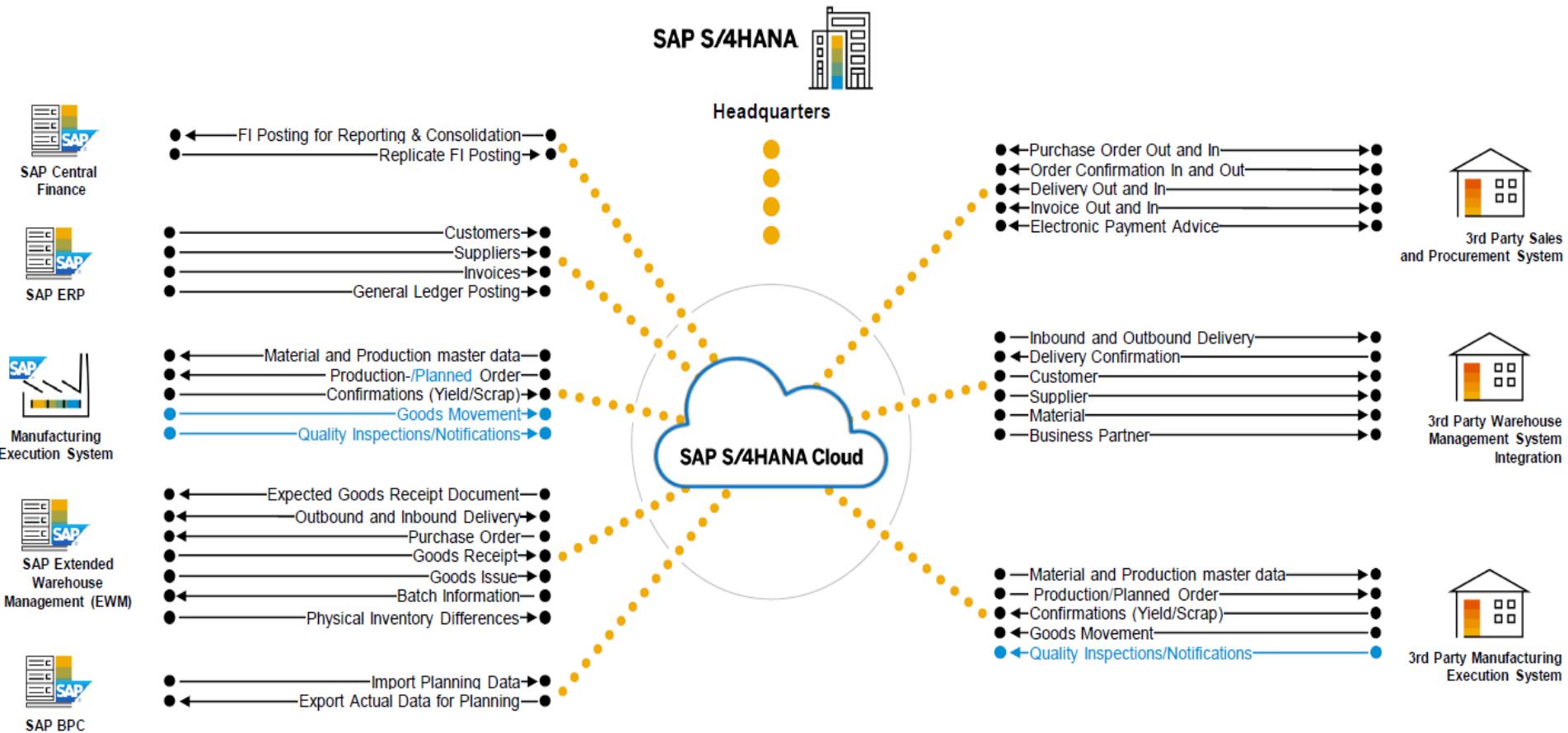
The main evolutionary line of the ERP systems is that one to open itself towards the outside supporting models of company "extended" or virtual.



ERP systems evolution: Extended ERP (2/3)



ERP systems evolution: Extended ERP (3/3)



Legacy systems VS ERP systems - exercise

Which are the main differences between Legacy and ERP systems?

Legacy Systems

- ...
- ...
- ...

ERP Systems

- ...
- ...
- ...

Legacy systems VS ERP systems

Legacy Systems

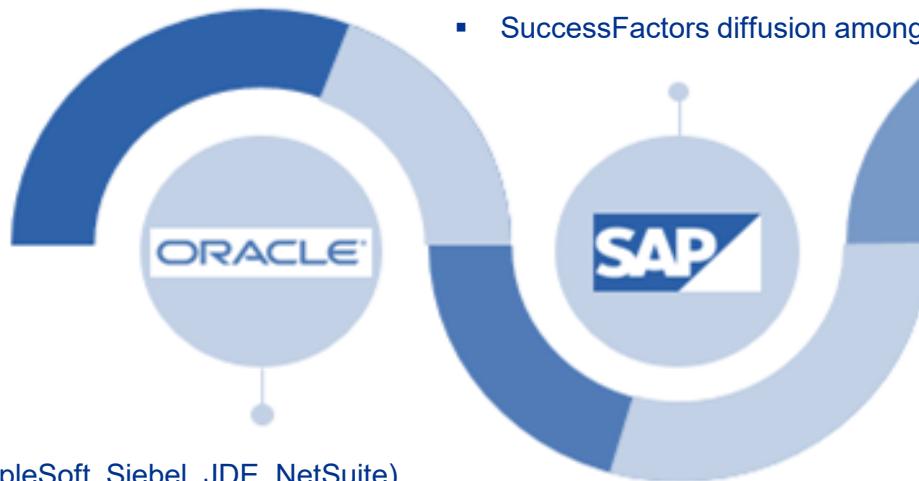
- Organization by Functions
- Software that grows with the company, adapting to it and its needs
- Often the result for the company is a set of modules distributed in different hardware/software environments and not perfectly integrated
- They are difficult to open to the external environment
- They serve in some cases in order to develop and to conserve the business know how
- The expansion of the perimeter of the business (geographically, new businesses, new processes)

ERP Systems

- Process Organization
- Software that is created by incorporating Best Practices
- They allow the strategic development of companies
- High degree of integration: a single hardware system and a single database
- Require companies to seek an alignment towards the best practices of the system
- Reduce the risk of dependence on developers' know-how

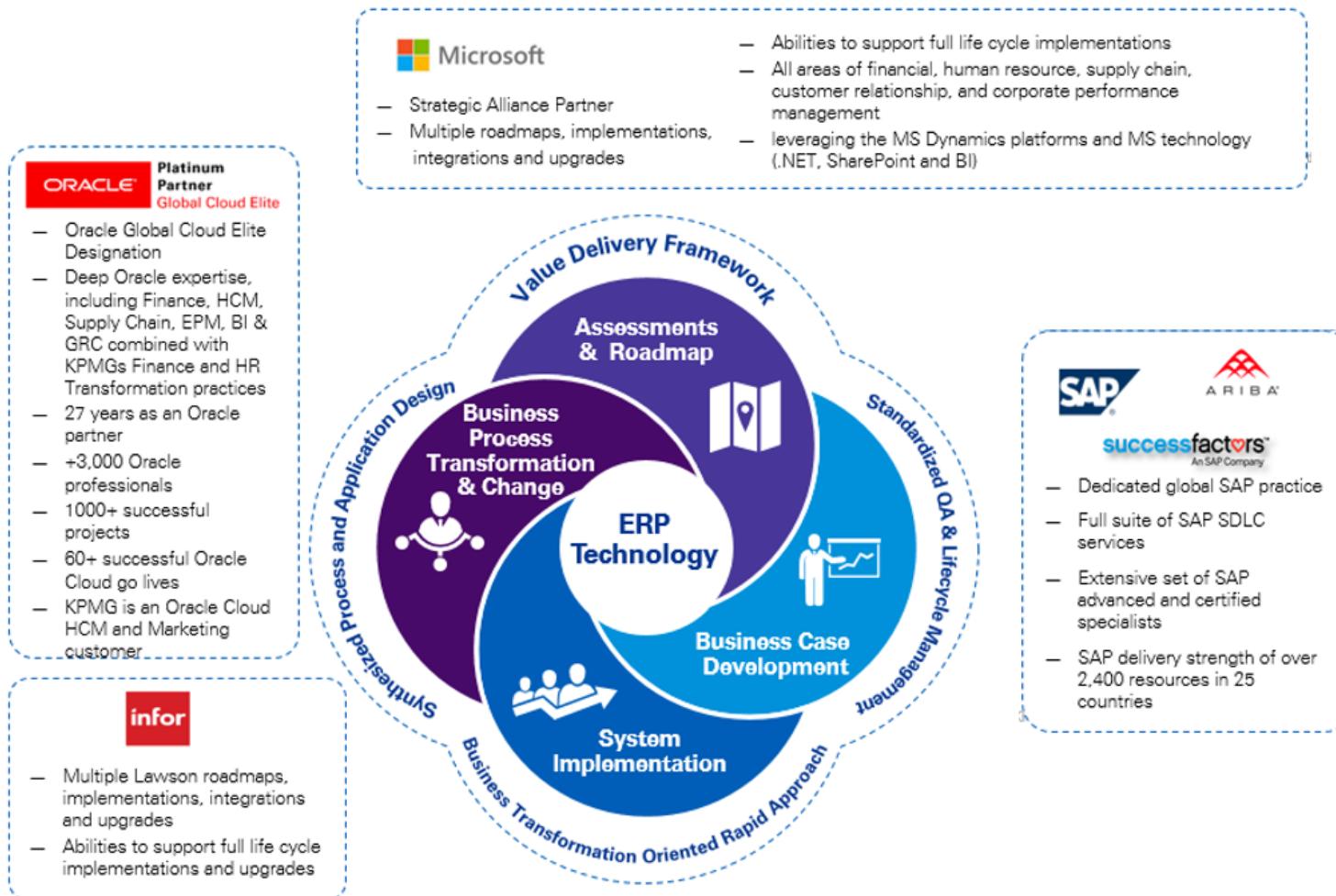
Key players in the ERP technology

- Growth by acquisition (SuccessFactors, Ariba, Concur)
- Market leader in “on premise” ERP systems
- Cloud approach, moving current on premise assets to cloud environments
- No SaaS
- More complex support due to structure/architecture
- SuccessFactors diffusion among SAP clients



- Acquisition (PeopleSoft, Siebel, JDE, NetSuite)
- Cloud products rebuilt in SaaS perspective
- Strong growth in Cloud Business
- Focused on both Hardware and Software
- Can provide the totality of solutions, from data centers for on premise applications to cloud solutions and with the necessary integrations

Overview of ERP sector skills

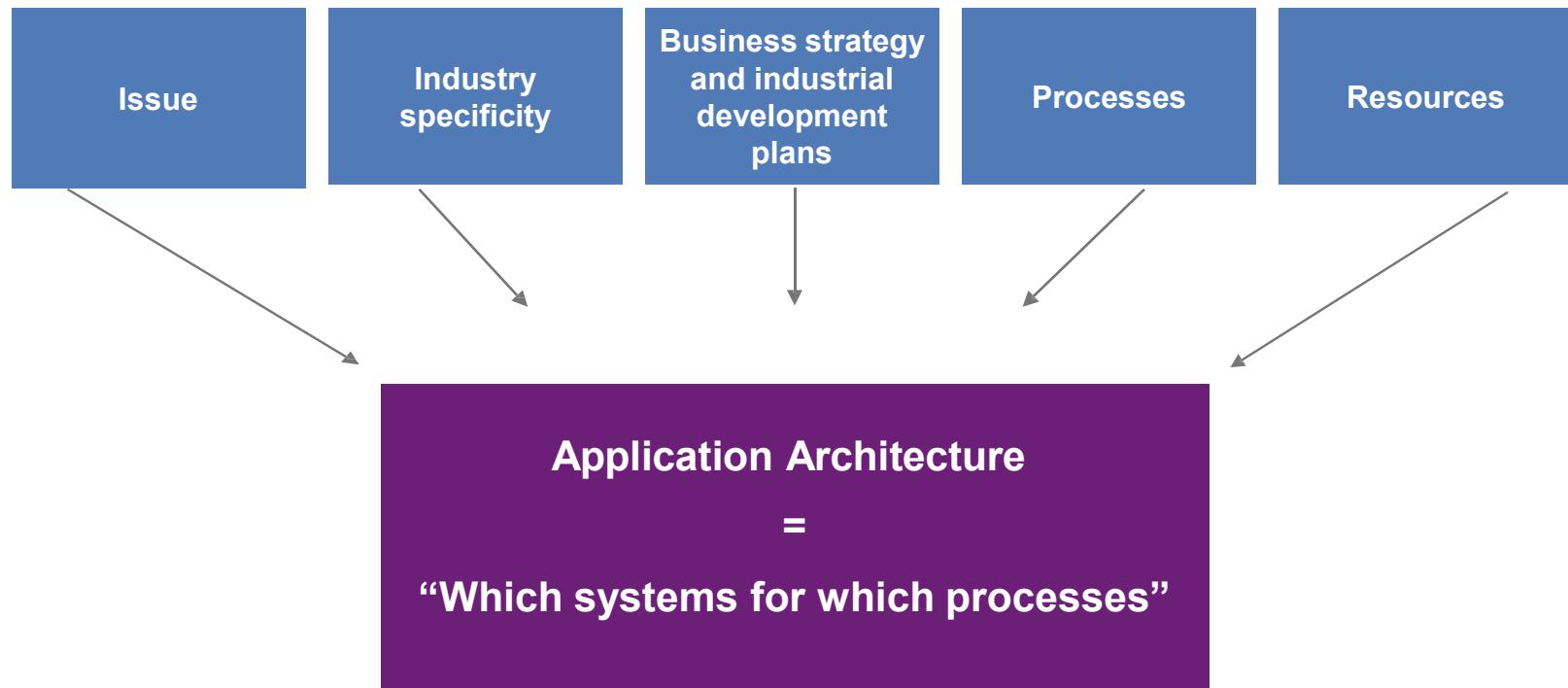


Agenda

1. From Legacy systems to ERP systems (historical evolution)
2. How ERP systems are made (levels, environment)
- 3. The introduction of an ERP system in the company**
4. SAP: sample of ERP system
5. ERP Projects
6. Recommended Approach
7. Discussion

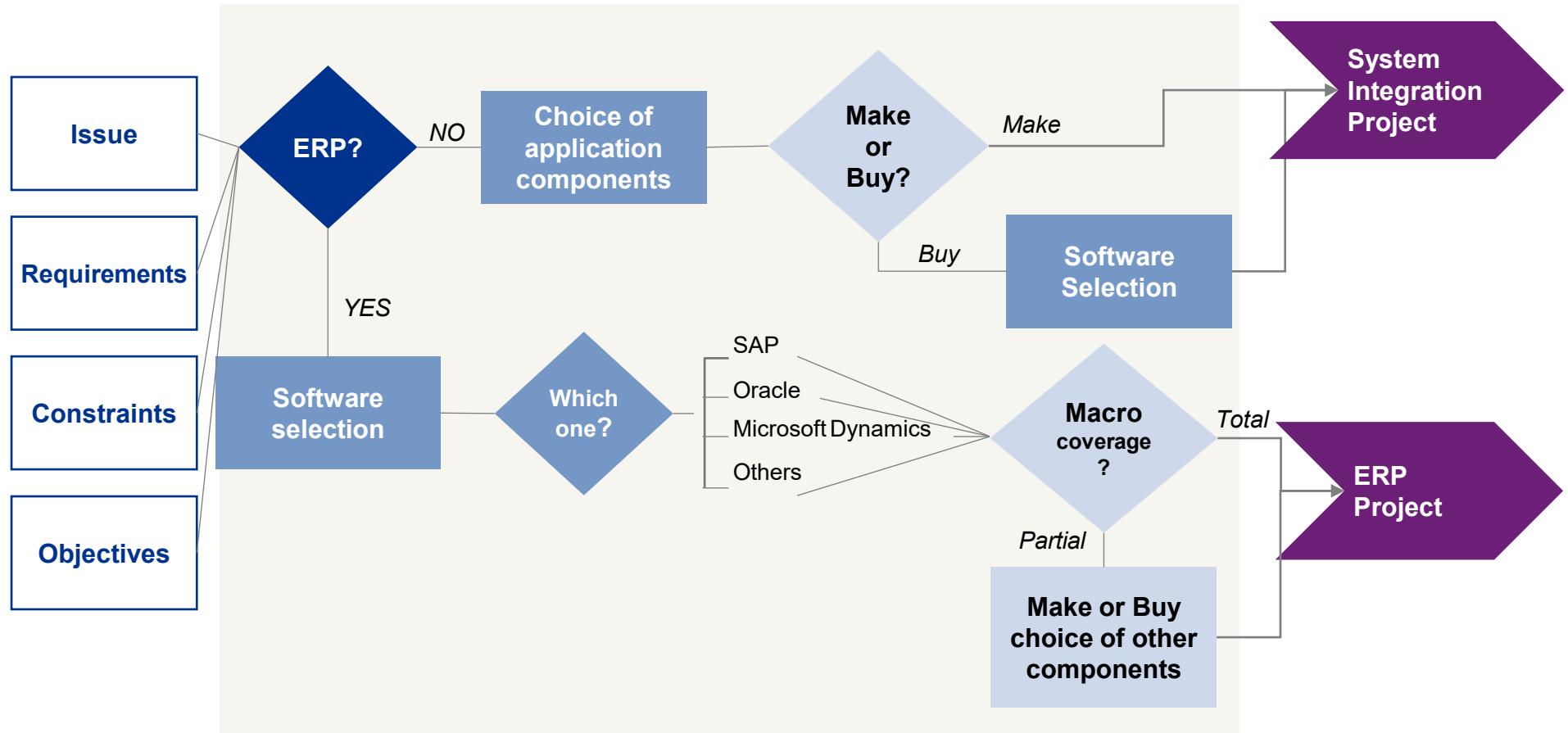
The choice of the ERP

The choice of an ERP should be framed within a broader definition of the application architecture that requires an articulated assessment of both the current technological and organizational situation and the business strategies and critical success factors of the company.



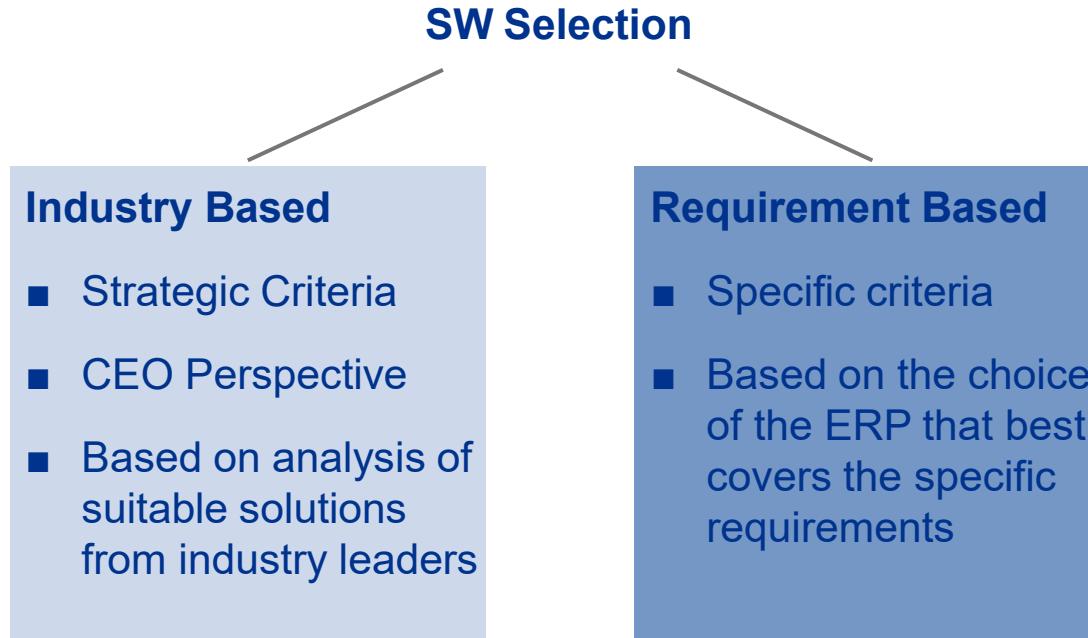
The choice of the ERP

Defining Application Architecture: The Logical Path



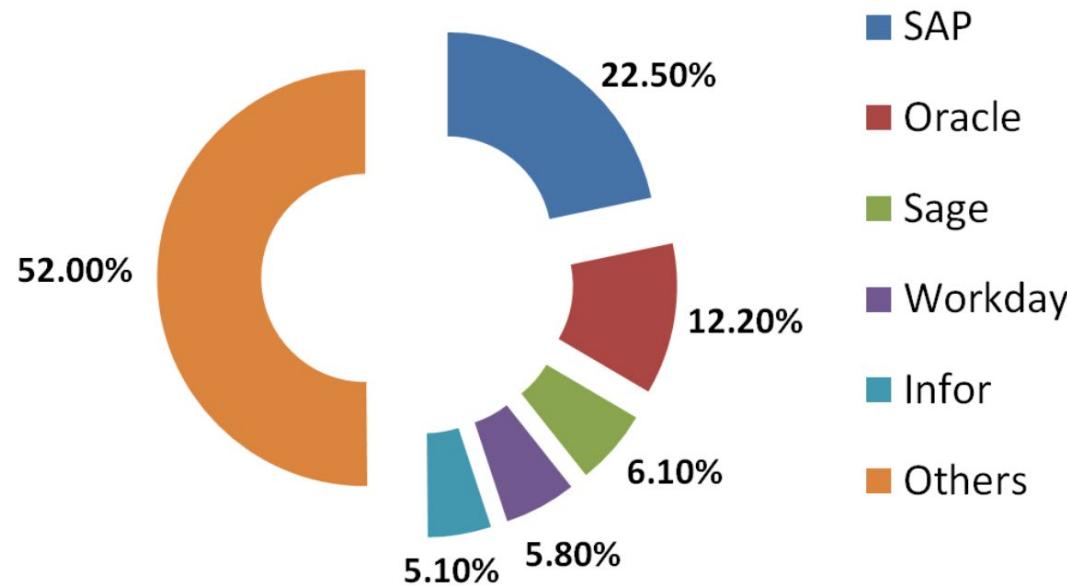
The choice of the ERP

Which ERP to choose?



Which ERP?

ERP Market share 2017



Agenda

1. From Legacy systems to ERP systems (historical evolution)
2. How ERP systems are made (levels, environment)
3. The introduction of an ERP system in the company
- 4. SAP: sample of ERP system**
5. ERP Projects
6. Recommended Approach
7. Discussion

SAP ERP

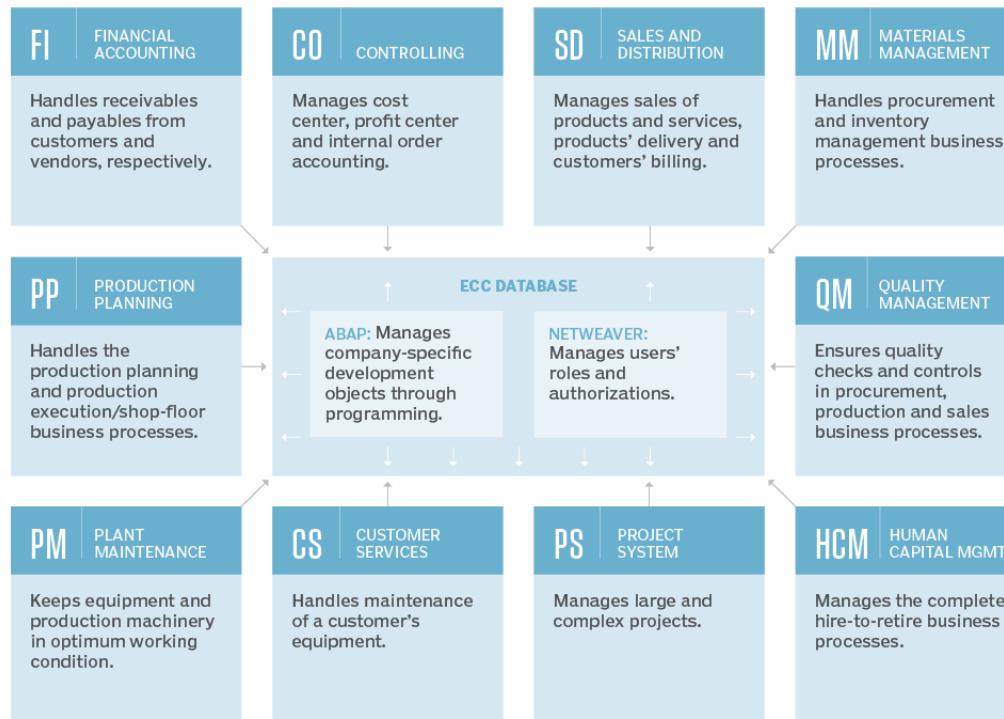
Sap R/3



- Software designed and developed in Walldorf, Germany by SAP AG founded in 1972
- It now covers most of the company functional areas (about 1200 processes)
- It is structured with Modules having a single Database
- It uses the most widespread hardware platforms with UNIX, NT/XP OS 400 operating systems
- It is based on hierarchical Client/Server technology on 3 levels
- It uses the most used DBMS (SQL, Oracle, DB2, Informix and also MySQL)
- It uses a proprietary language of IV generation called ABAP/4
- The current version of the ERP is SAP ECC 7.0, also known as MYSAP ERP 7.0.
- The concept of "Extended ERP" has been realized through the Netweaver platform characterized mainly by a single Web Application Server (WAS)

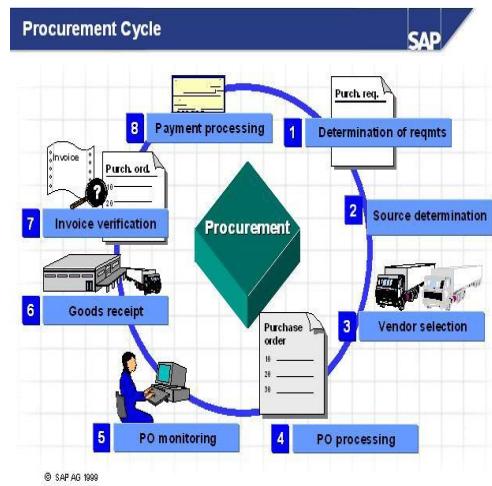
Traditional SAP Modules

MySAP ERP = Enterprise Core Component (ECC)

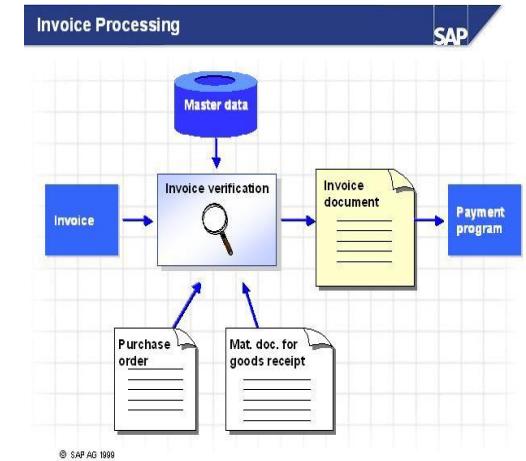
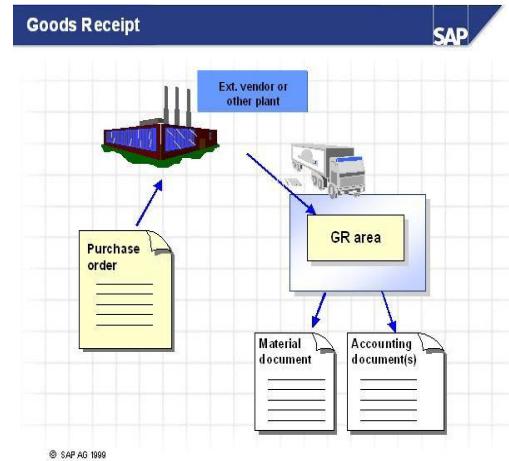
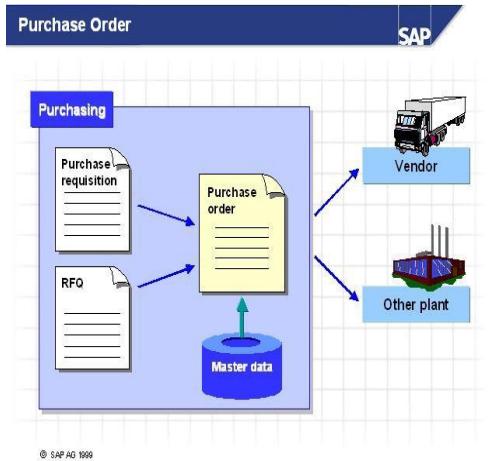


- SAP system is currently structured by processes and scenarios.
- Among insiders, the module concept remains absolutely central.

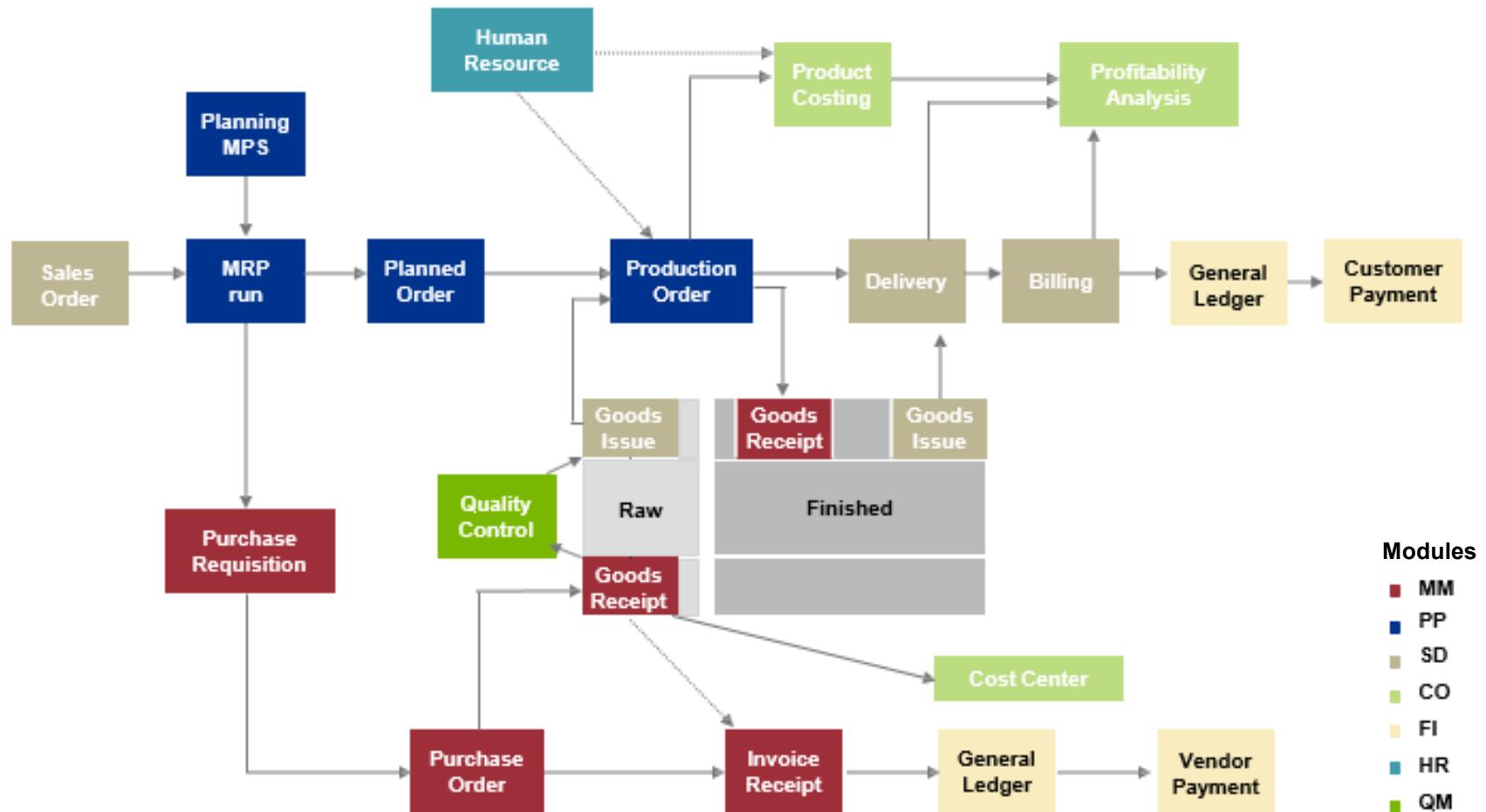
Sample of purchasing flow



The SAP purchasing process is an excellent example of the characteristics of a process integrated on ERP and subsequently extended with Extended ERP solutions.



Sample of "Order Fulfillment"



Main Modules



Financial

- General Ledger
- Accounts Receivable
- Accounts Payable
- Tax and Financial Reports
- Special Purpose Ledger
- Legal Consolidations



Controlling

- Cost Center Accounting
- Profit Center Accounting
- Profitability Analysis
- Product Cost Controlling
- Internal Orders



Asset Management

- Depreciation
- Property Values
- Insurance Policies

Main Modules



Sales and Distribution

- Quotations
- Sales Order Management
- Pricing
- Delivery
- Invoicing



Material Management

- Procurement
- Inventory Management
- Vendor Evaluation
- Invoice Verification
- Warehouse Management



Production Planning

- Sales & Operations Planning
- Material Requirements Planning
- Production Activity Control
- Capacity Planning



Plant Maintenance

- Plant Maintenance
- Preventive Maintenance
- Service Management

Main Modules



Basis Component

- Security Authorization Concept
- ABAP/4 Development Workbench
- Output Management
- Administrative Utilities
- Backup and Recovery
- Job Scheduling
- Transport Management System
- Database Administration



Human Resources

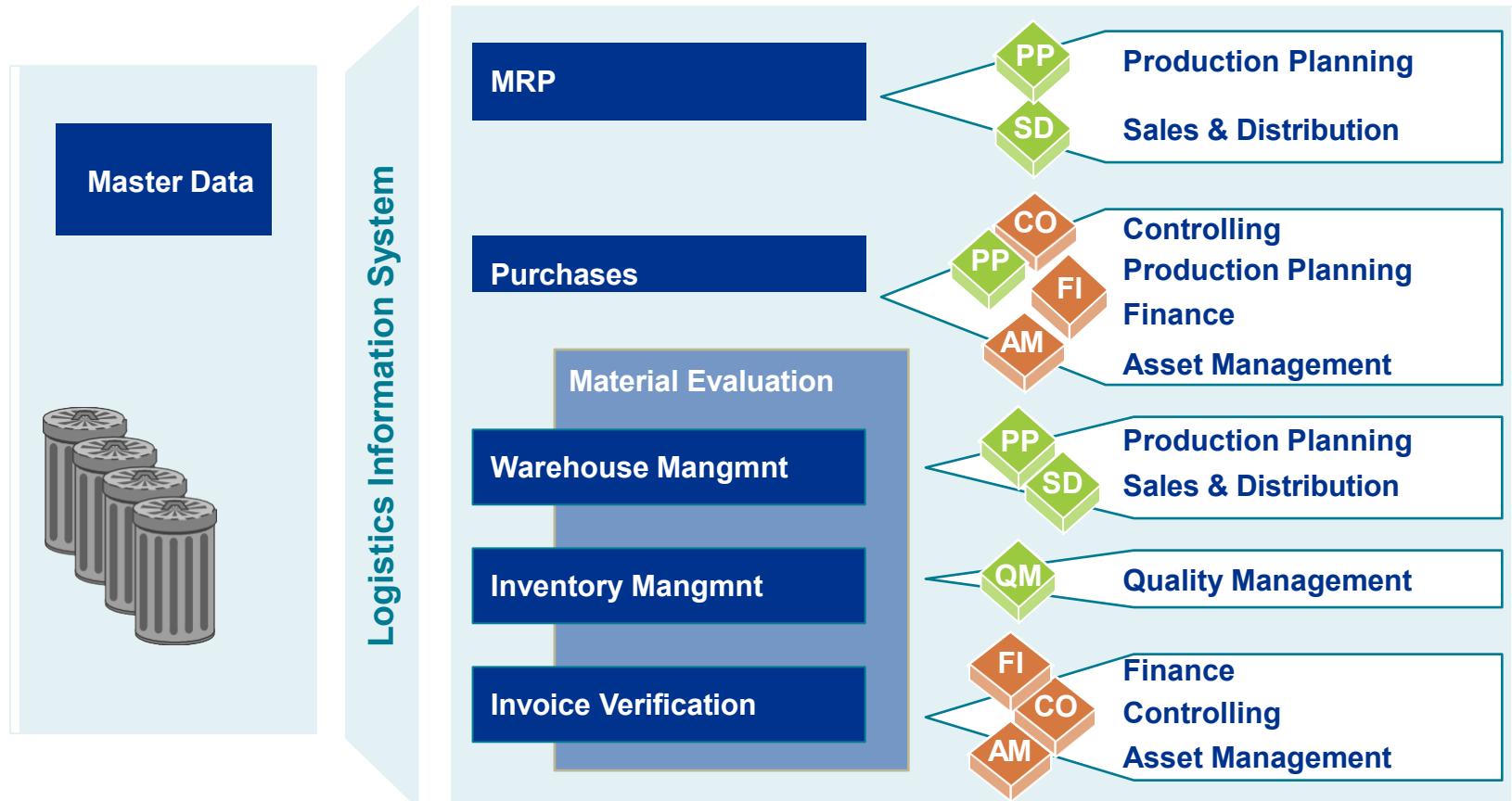
- Personnel Administration
- Payroll, Benefits
- Time Management
- Planning and Development
- Organization Management



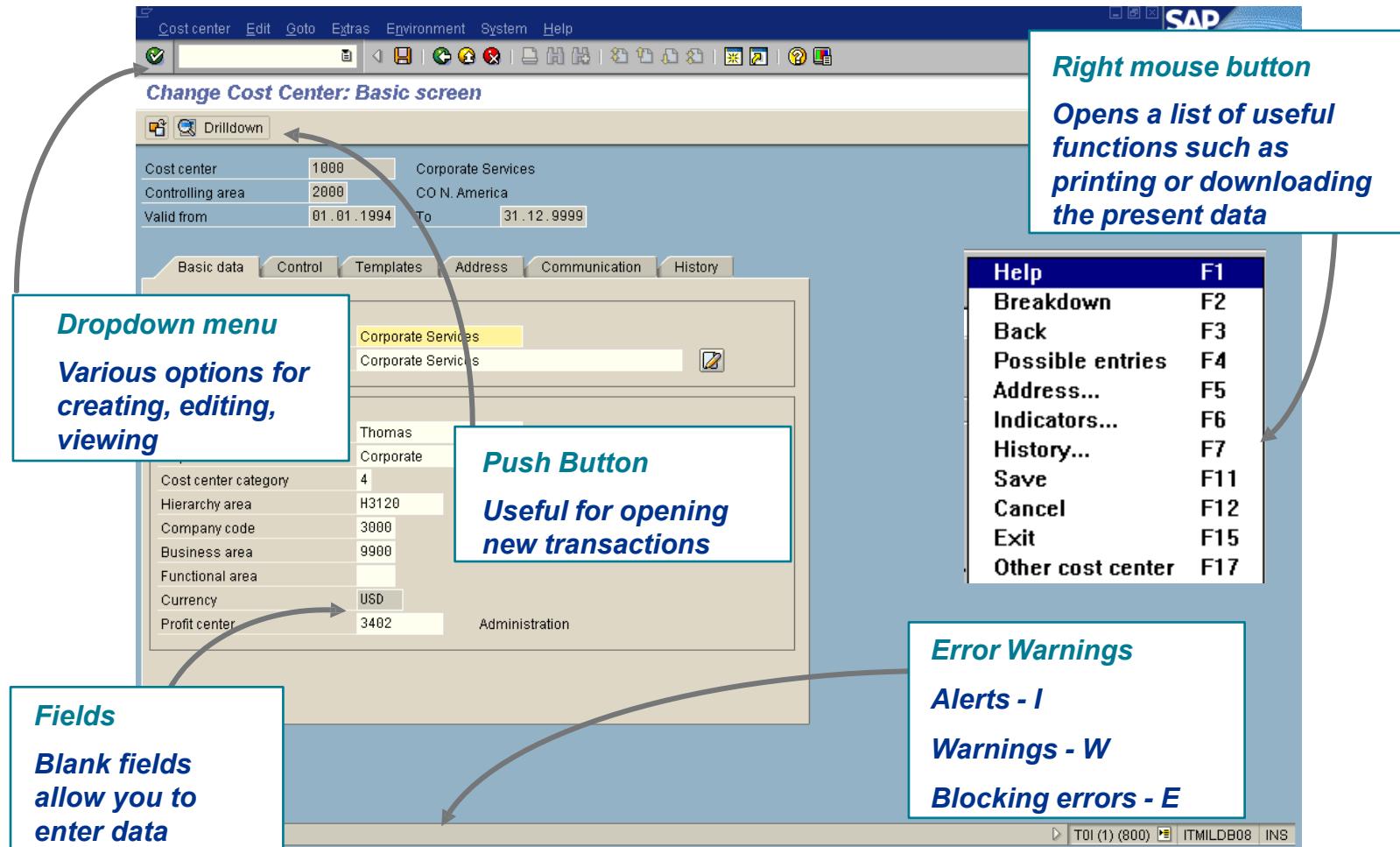
Project System

- Project Tracking
- Budget Management
- Cost and Revenue Planning
- Networks and Resources

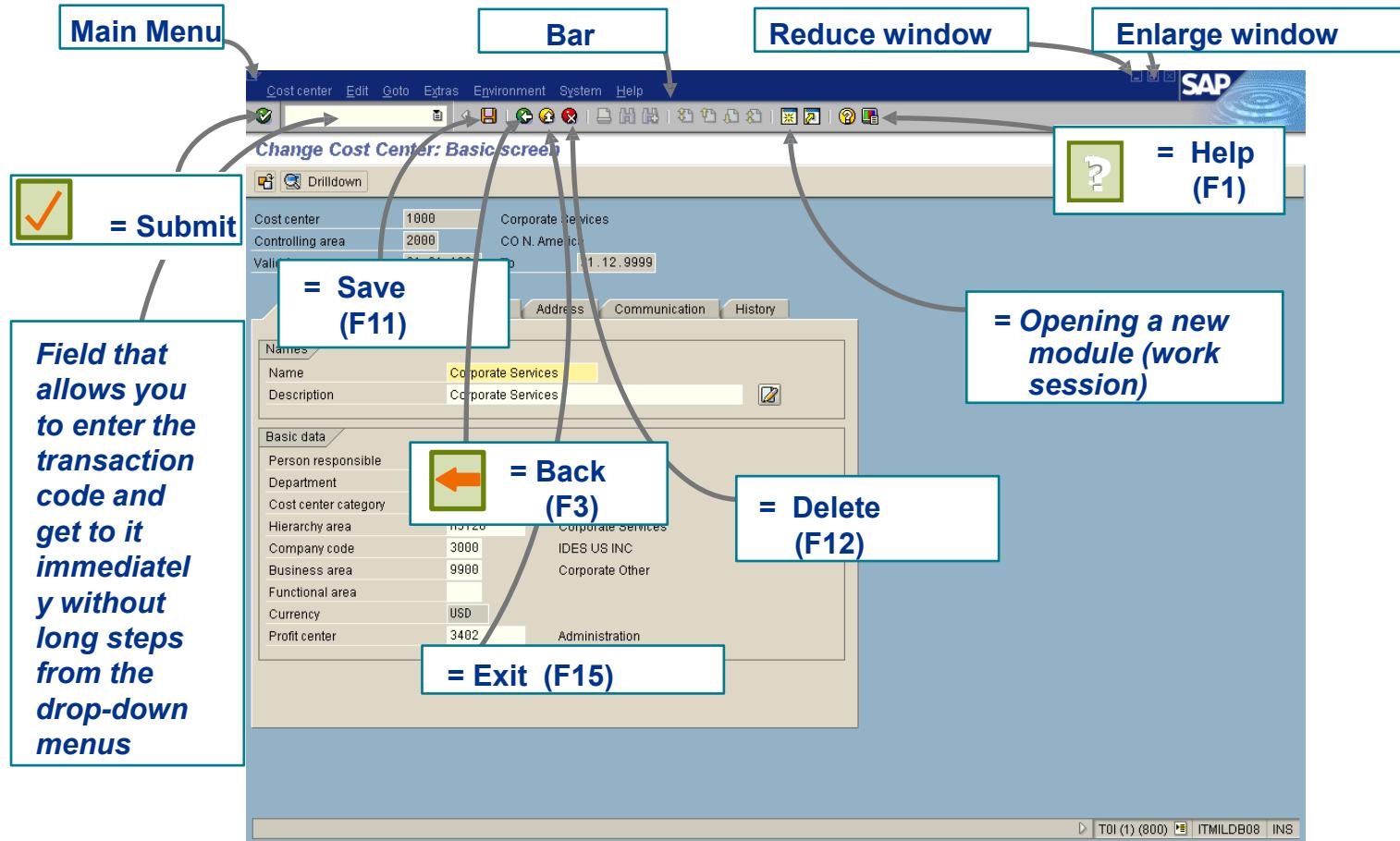
Sample of integration between Modules - MM



User Interface



User Interface



Agenda

1. From Legacy systems to ERP systems (historical evolution)
2. How ERP systems are made (levels, environment)
3. The introduction of an ERP system in the company
4. SAP: sample of ERP system
- 5. ERP Projects**
6. Recommended Approach
7. Discussion

Impact on the Business



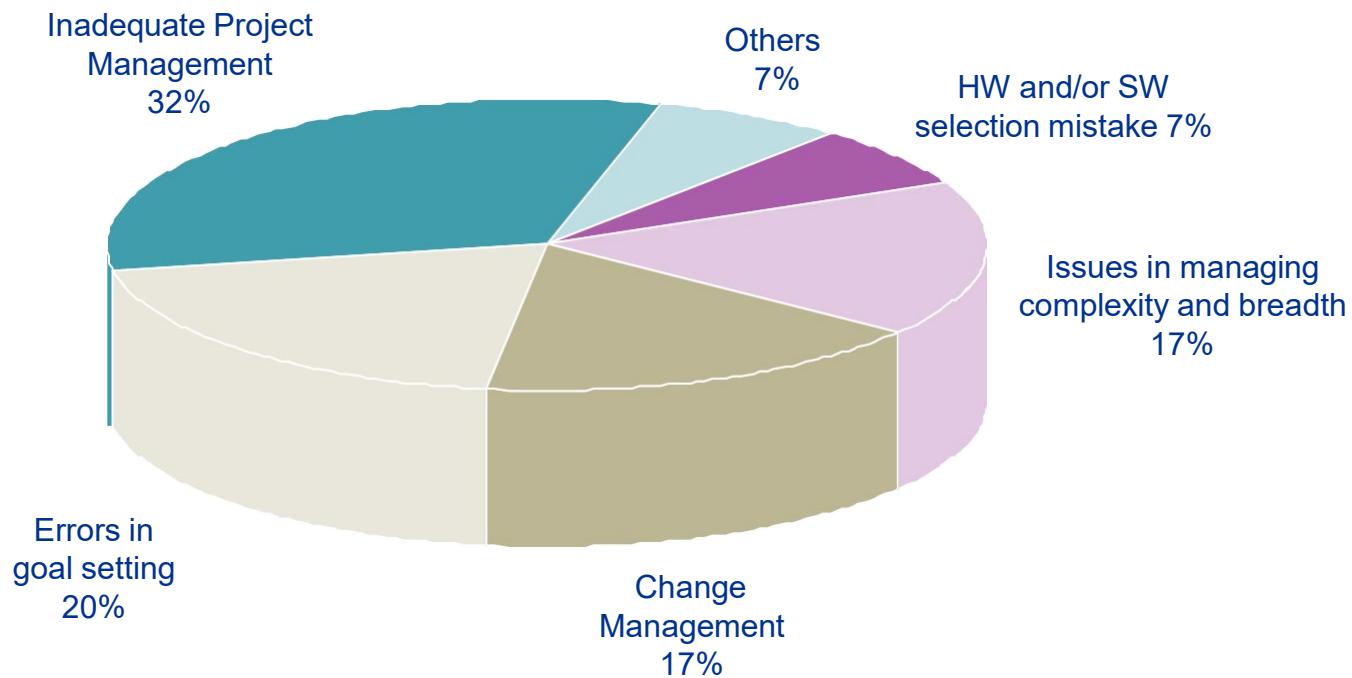
The ERP project is one of the primary agents of business change and a unique opportunity for companies to renew their organizational and cultural system.

The impact of ERP projects that are most significant for the company are those on human resources, on their ways of working.

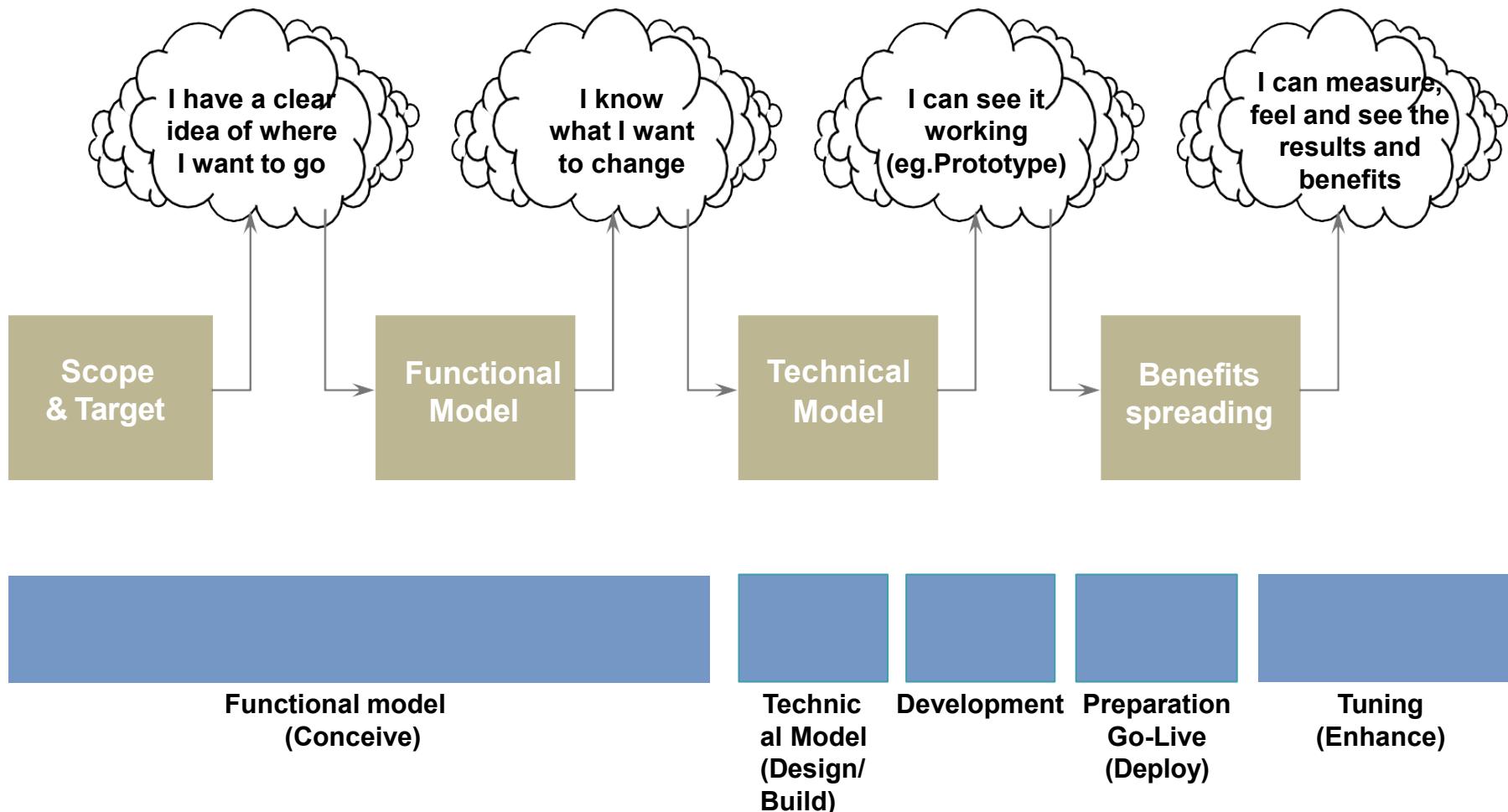
The business impacts of the ERP project must be addressed and managed with great care both to achieve the project objectives and to contain the project risk.

Impact on the Business and Project risks

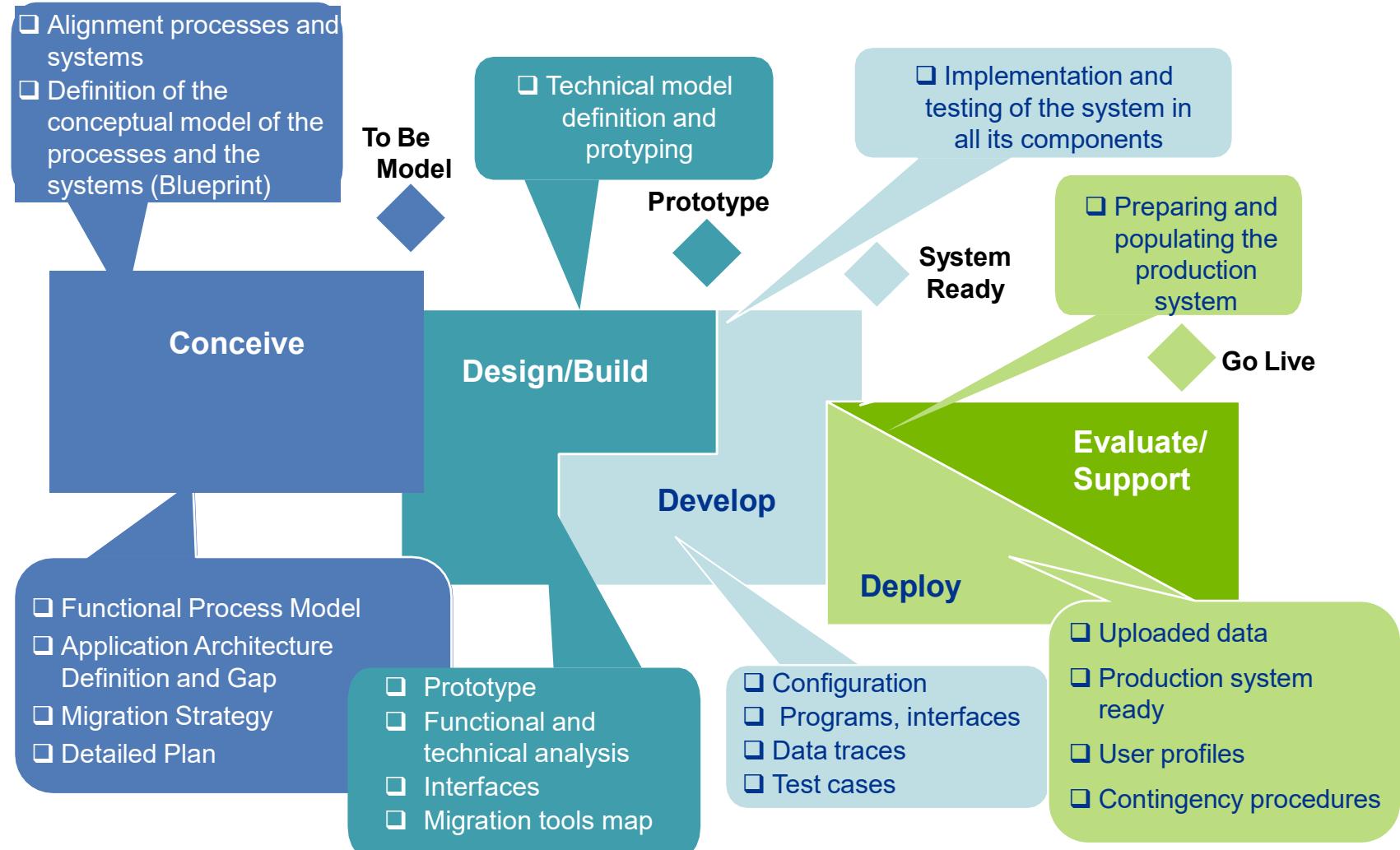
KPMG conducted a survey of 252 companies. The main reasons for the lack of success of information systems are as follows:



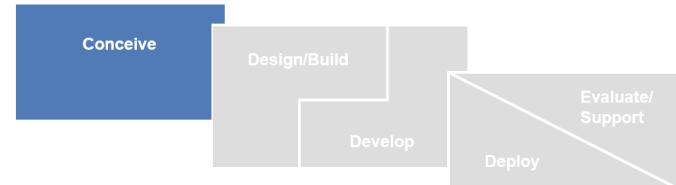
The Methodology



The Methodology



Process and System Alignment - Conceive: Process Representation

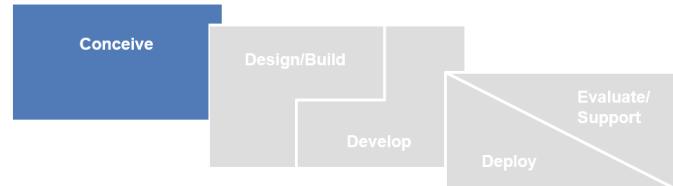


Alignment between processes and systems requires a clear representation of As Is and To Be processes, as the new trending model of business processes initiates the requirements definition and management process that is the backbone of a BPR or ERP project.

There are many ways to represent the processes of the trending model, the choice of which depends on the context, the client, the time availability and the objectives.

Process and System Alignment - Conceive: Process Representation

For ERP projects, the procedure (or circulation) diagrams represent the most suitable solutions (on the columns the organizational units, on the rows the process steps)



Traditional Flow Chart Originated from work analysis

[Process Charts](#) (Process Flow Chart, string/Spaghetti Chart diagram)

[Procedure Charts](#) (Forms Flow Chart (Circulation diagram))

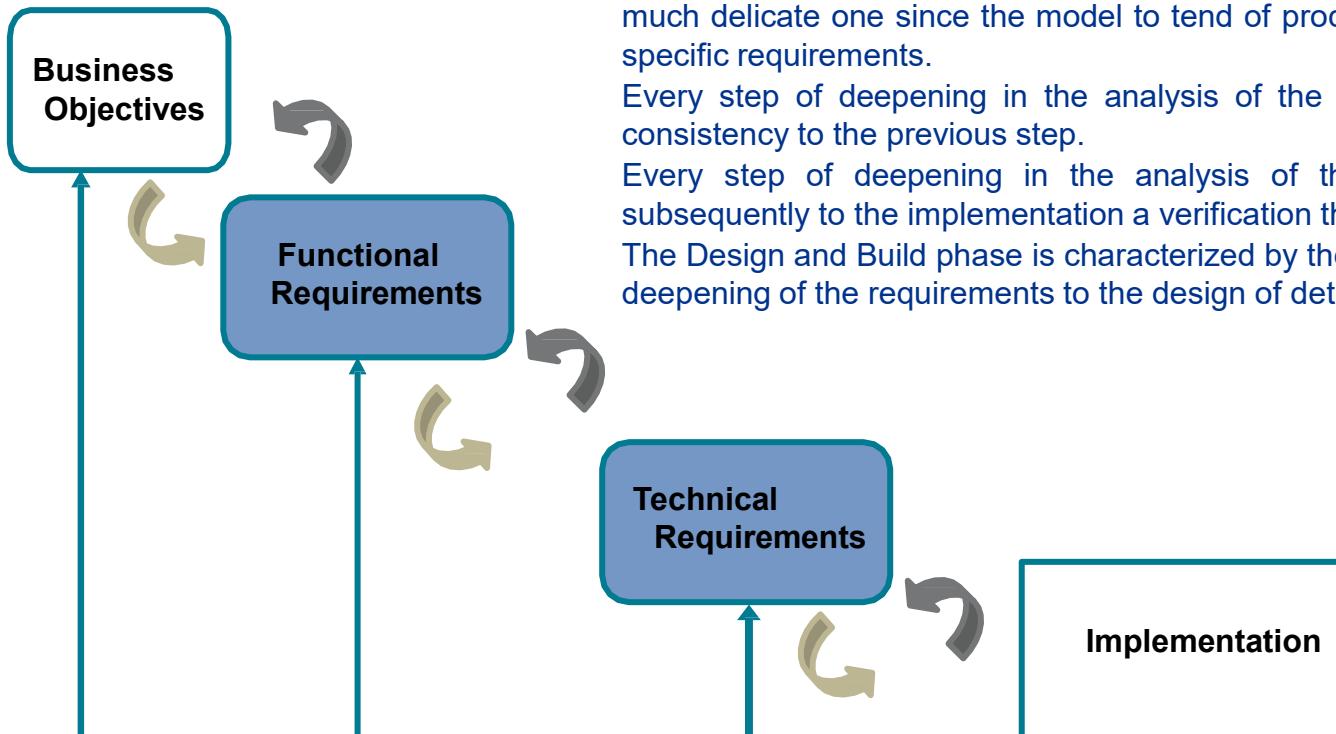
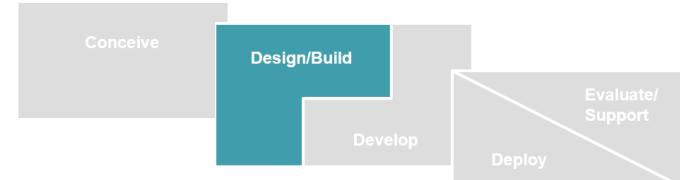
Semi-formal diagram Describe information processing procedures

[DFD, ISAC, IDEF](#)

Complex Modeling - Based on paradigms other than procedural flow (Petri network, ICN, TODOS)

In recent years, international process mapping standards based on the concept of Business Process Markup Language (BPML), such as BPMN, have become widespread and can be transformed into workflow models for modern Business Process Management systems.

Requirements Management - Design: Requirements Chain



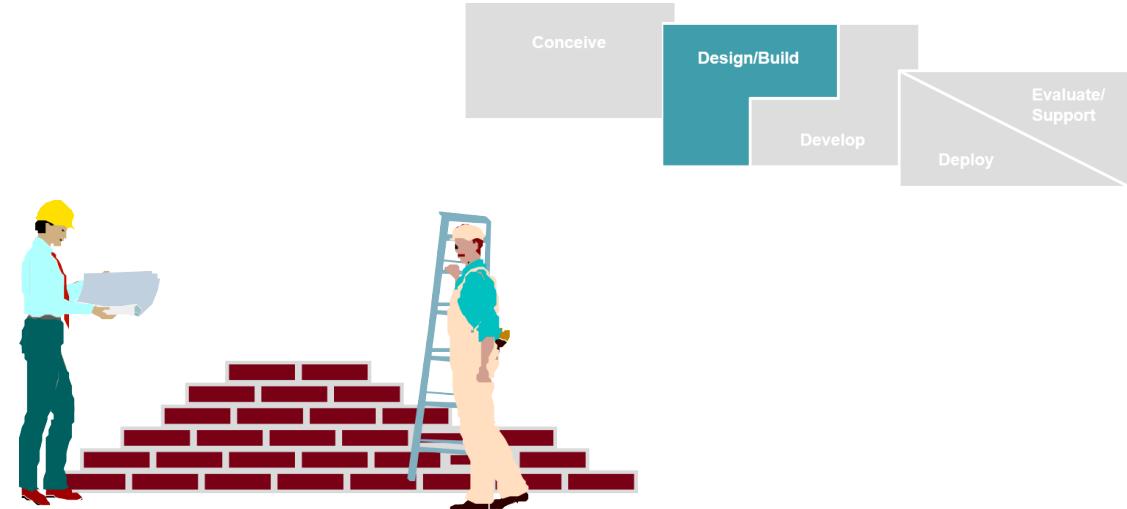
The step from the design of the process to the realization of the system is much delicate one since the model to tend of process must transform itself in specific requirements.

Every step of deepening in the analysis of the requirements demands the consistency to the previous step.

Every step of deepening in the analysis of the requirements demands, subsequently to the implementation a verification through a specific test.

The Design and Build phase is characterized by the development and from the deepening of the requirements to the design of detail of the solution.

Requirements Management - Design: Prototype Management

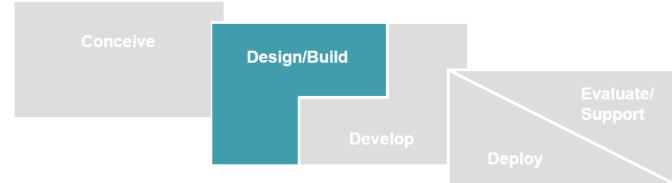


The prototype has three functions:

- Allow functional requirements to be highlighted by having users see a concrete example
- Allows to support with concrete examples the choice between different implementation and configuration options
- Allowing to highlight the process scenarios as a difference from the base scenario

The prototype is always prepared on the base case and then extended to other scenarios in subsequent prototypes

Requirements Management - Design: coverage of requirements and gaps

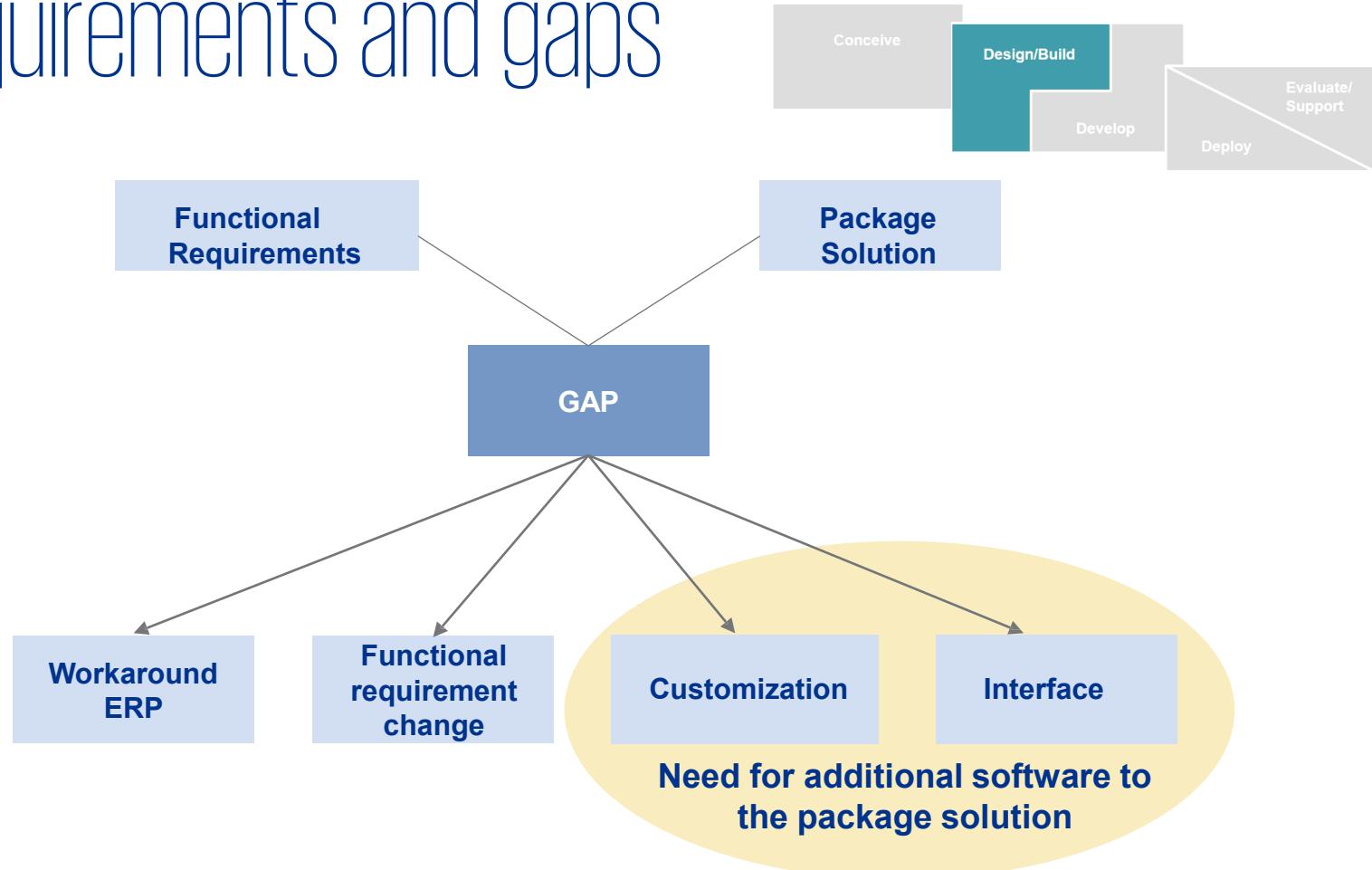


Frequently more than 80% of the requirements can be covered by the packaged solution... assuming you have chosen the right solution and approach.

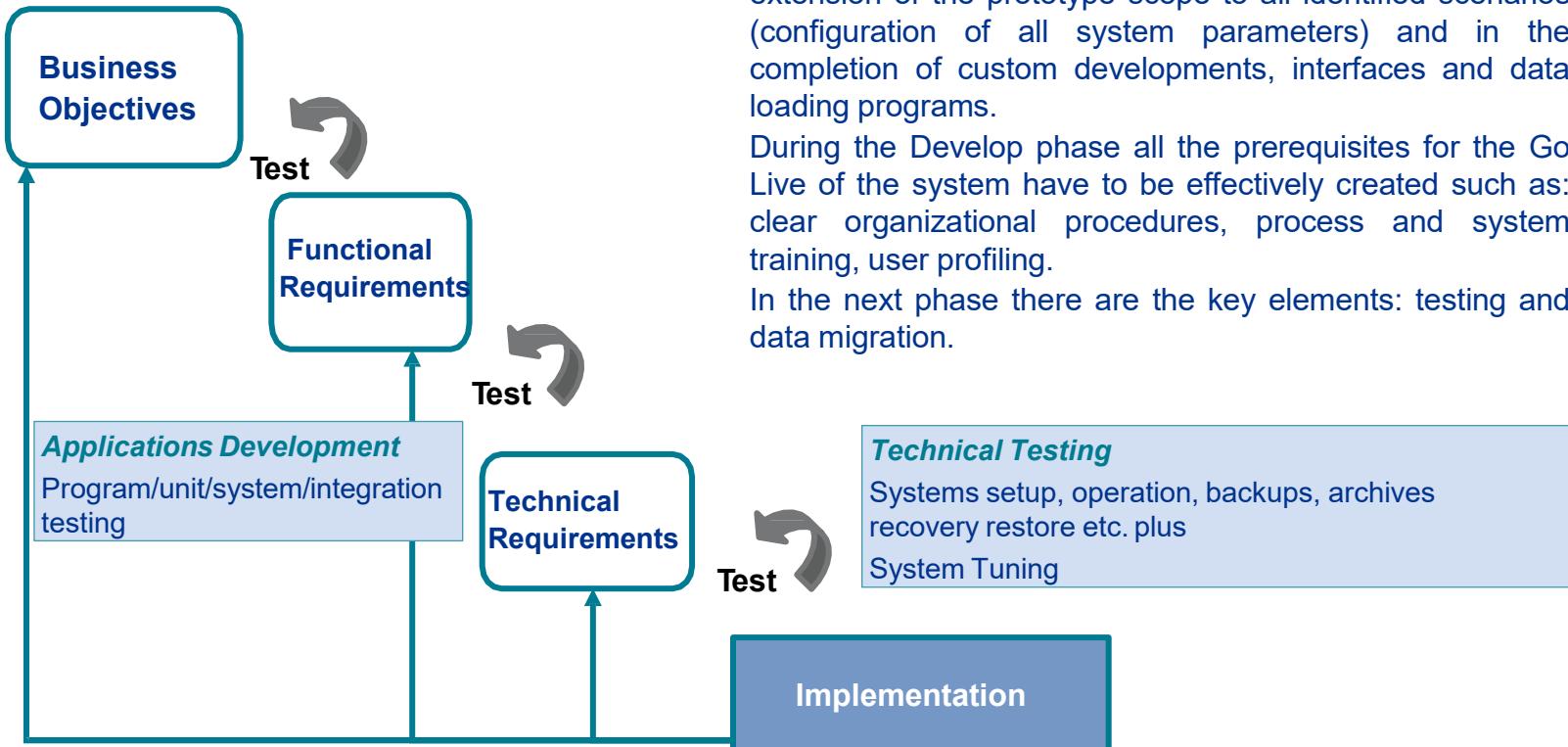
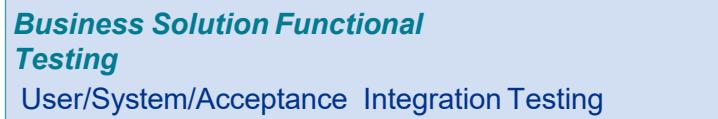
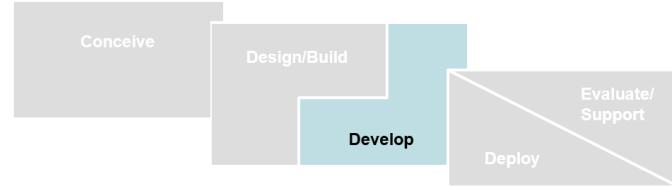


The effort in ERP projects is to trace the identified solution back to standard solutions; Gaps unfortunately exist and need to be identified, documented and managed.

Requirements Management - Design: coverage of requirements and gaps



Test and data migration - Build: implementation and testing



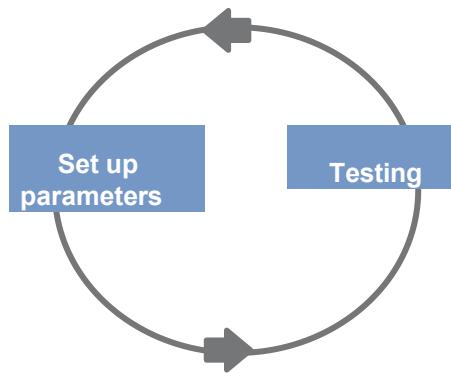
The realization of the information system is realized in the extension of the prototype scope to all identified scenarios (configuration of all system parameters) and in the completion of custom developments, interfaces and data loading programs.

During the Develop phase all the prerequisites for the Go Live of the system have to be effectively created such as: clear organizational procedures, process and system training, user profiling.

In the next phase there are the key elements: testing and data migration.

Test and data migration - Build: type of tests

The Test can be read as an evolution of the prototype cycles, the tests however have an official and contractual value from the point of view of KPMG



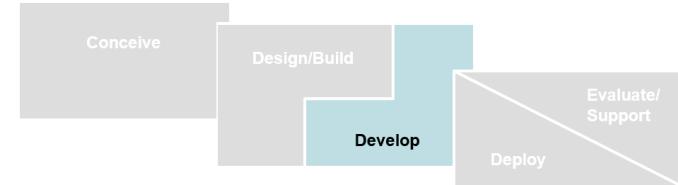
Type of Test

Necessary

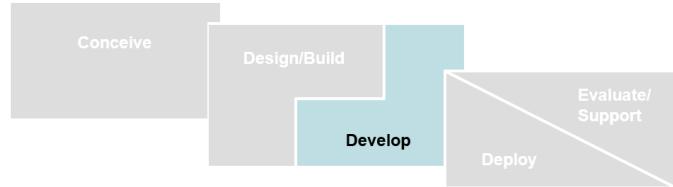
- **Unit Testing:** testing of individual modules is done by the core team
- **System Testing:** Connection between the different modules within the ERP test
- **Integration Testing:** Entire process with integrated testing between interfaced components test
- **Data Load/Conversion tests:** Quality of the loaded data, normally it is inserted inside an integration test

Optional

- **User Acceptance Testing:** user validation
- **Parallel Running:** extensive testing to verify the process and develop user readiness
- **Model Office:** test oriented to the verification of the workload on the specific organizational unit



Test and data migration - Build: regression test



During the testing period, system changes are very dangerous which could impact on other business processes or areas. It is therefore necessary to test all potentially impacted areas.

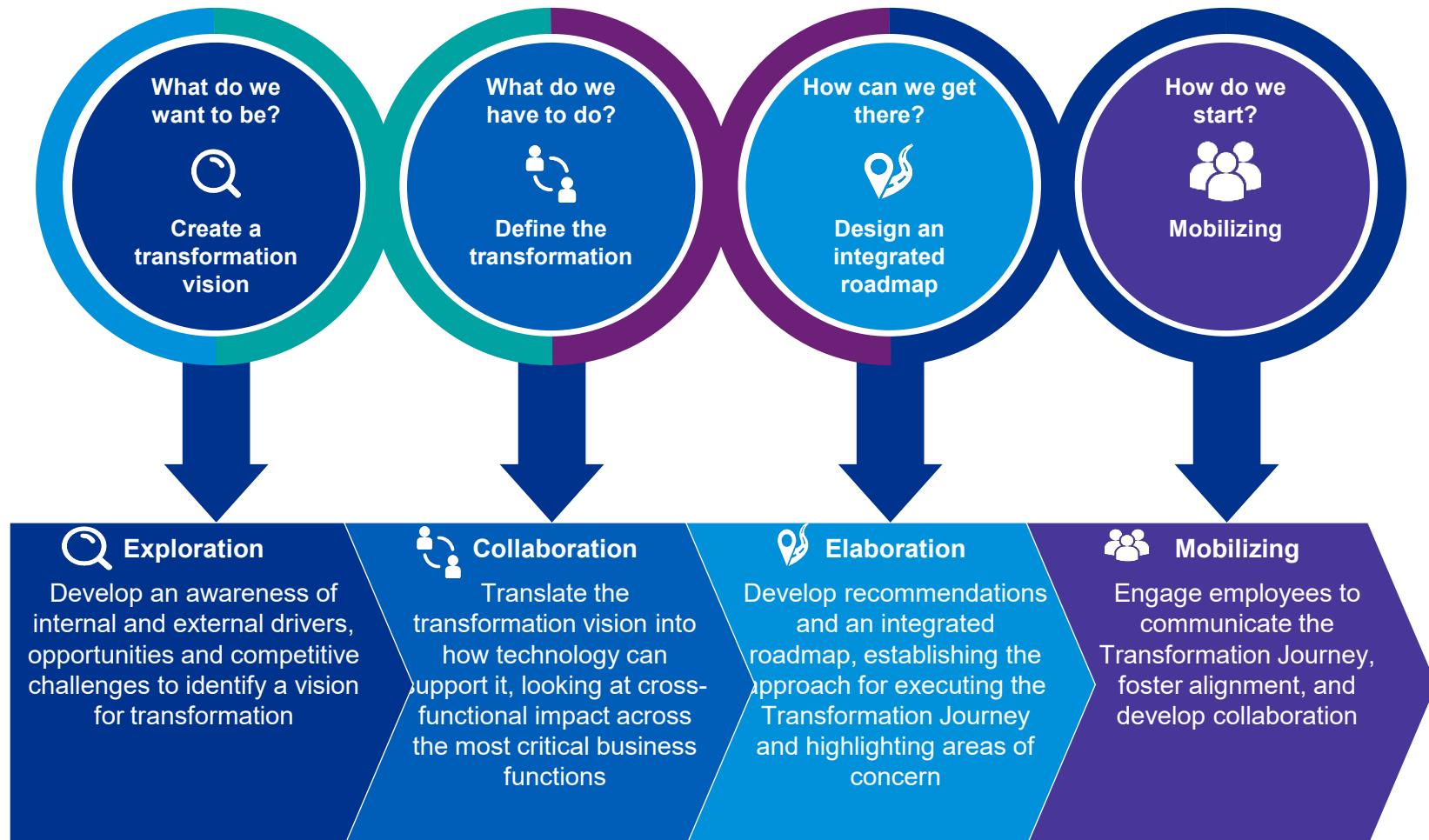
Therefore:

- ➡ Changes during testing could cause many problems
- ➡ The system should be kept as stable as possible
- ➡ Delay minor changes to later moments

Agenda

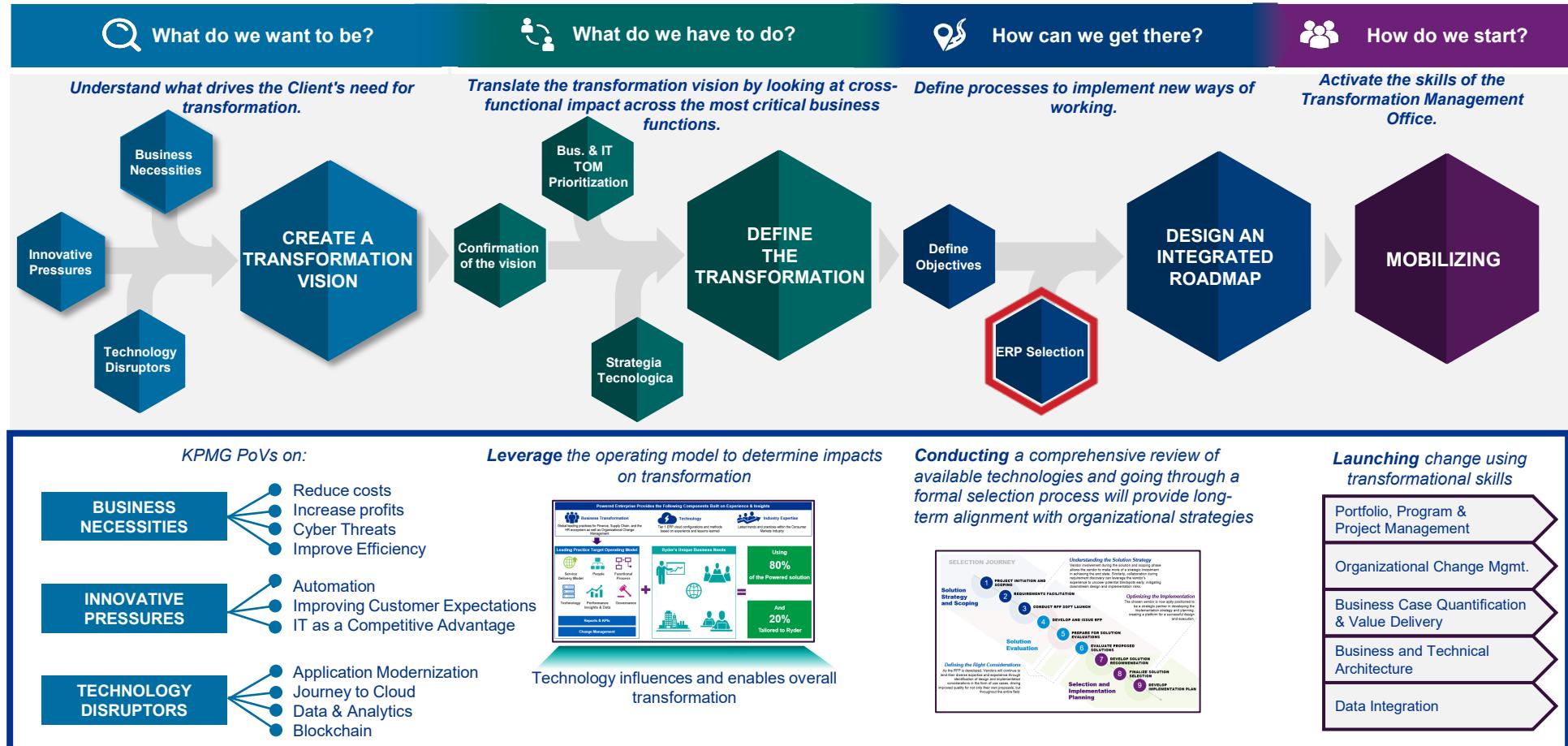
1. From Legacy systems to ERP systems (historical evolution)
2. How ERP systems are made (levels, environment)
3. The introduction of an ERP system in the company
4. SAP: sample of ERP system
5. ERP Projects
6. **Recommended Approach**
7. Discussion

4 questions before choosing your software



Recommended Approach

It is important to perform a key strategy and activity planning before implementation



Project Approach (1/2)

Phase 1 SOLUTION STRATEGY AND SCOPING		Phase 2 SOLUTION EVALUATION		Phase 3 SELECTION & IMPLEMENTATION PLANNING	
Objective	Objective	Objective	Objective	Objective	Objective
<ul style="list-style-type: none"> — Confirm project goals, scope, and business drivers — Understand current status and documentation requirements — Define an RFP timeline — Initiate vendor communications 	<ul style="list-style-type: none"> — Develop and issue Request for Proposal (RFP) — Establish selection criteria to evaluate proposed solutions — Evaluate proposed solutions through work sessions and on-site presentations 	<ul style="list-style-type: none"> — Provide guidance and support for solution selection and contract negotiation — Deliver a roadmap with high level of implementation for the selected solution 			
Key Activities	Key Activities	Key Activities	Key Activities	Key Activities	Key Activities
1. Project Initiation & Scoping <ul style="list-style-type: none"> — Define program governance & structure — Listen to stakeholders to understand strategic goals and drivers — Conduct an internal kick-off — Define RFP timeline and communication plans 2. Develop Key Requirements <ul style="list-style-type: none"> — Organize Finance, HCM, and Technical workshops on current status — Identify the top 20-25 requirements per process area for the future business model — Identify key technologies and related structural requirements 3. Conduct RFP Soft Launch <ul style="list-style-type: none"> — Analyze the supplier's industry and marketplace — Finalize solutions to include — Initiate vendor communications and gather feedback 	4. Develop and Issue RFP <ul style="list-style-type: none"> — Finalize requirements — Define initial T&Cs for vendor review — Create and submit RFPs 5. Prepare for Solution Evaluations <ul style="list-style-type: none"> — Establish selection criteria for evaluating proposed solutions — Implement cases/demos — Identify evaluators and conduct vendor briefings — Consolidate vendor Q&A log and conduct follow up sessions — Conduct vendor workshops 6. Evaluate Proposed Solutions <ul style="list-style-type: none"> — Review and evaluate RFP responses — Conduct and evaluate vendor workshop demos by leveraging product experts for Q&A — Evaluate vendor references — Conduct independent KPMG assessments — Consolidate KPMG assessment and responses 	7. Develop Solution Recommendation <ul style="list-style-type: none"> — Compare the evaluation criteria scores for different solutions — Summarize the findings for the executive briefing 8. Finalize Solution Selection <ul style="list-style-type: none"> — Finalize approach to solution selection — Conduct a review meeting for the final solution — Finalize solution recommendations — Determine the implementation process for project approval — Discuss the negotiation process 9. Develop Implementation Plan <ul style="list-style-type: none"> — Conduct workshop implementation plans — Develop a roadmap with high level of implementation including scope, timeline, approach to phases, and resources needed — Facilitate project initiation 			

Recommended Approach

Project Approach (2/2)



Accelerator: KPMG Powered Enterprise (KPE)

KPMG Powered Enterprise is a complete ERP transformation approach that allows you to build your technology strategy, accelerate by identifying key vendor requirements, and be well positioned for the implementation phase. KPE allows you to start with the end in mind to ensure that the strategy and selected vendors are aligned with the desired business outcome and eliminate rework and adjustments as you progress along the way.

What is	<ul style="list-style-type: none">— Operational templates for Finance, Procurement & HR, process leaders, pre-configured tools and Configured Cloud Technologies are 80% predefined to ensure a quick start.— The remaining 20% is built based on customer needs, to focus on what is really important in their business.
How it is used	<ul style="list-style-type: none">— KPMG leverages KPE's predefined processes and operating models to quickly define the current state and identify opportunities that will help achieve its business goals.— The current state definition and KPMG's leading practice will determine the critical technology requirements for supplier assessment. This will lead to vendor review, selection criteria, and future state recommendations.
Which benefits	<ul style="list-style-type: none">— Reduced time required to identify current state and define future state requirements.— Decisions based on ERP leading practices to identify where technology can help.— Prepares for strategy and vendor selection, plus provides an accelerated path to implementation.

Advantages of KPE

No time wasted mapping As-is state and To-be processes



Start with the KPMG standard of "To be" processes and then determine what needs to be done on a bespoke basis

Faster delivery thanks to pre-configured processes enabled by the technology



Reduce project duration through traditional business transformation

Review vs. Create avoiding endless workshops and time to make decisions



Shorter workshops with responsible approvers of pre-configured processes, greater focus on high-value process areas

Interactive validation with new technology



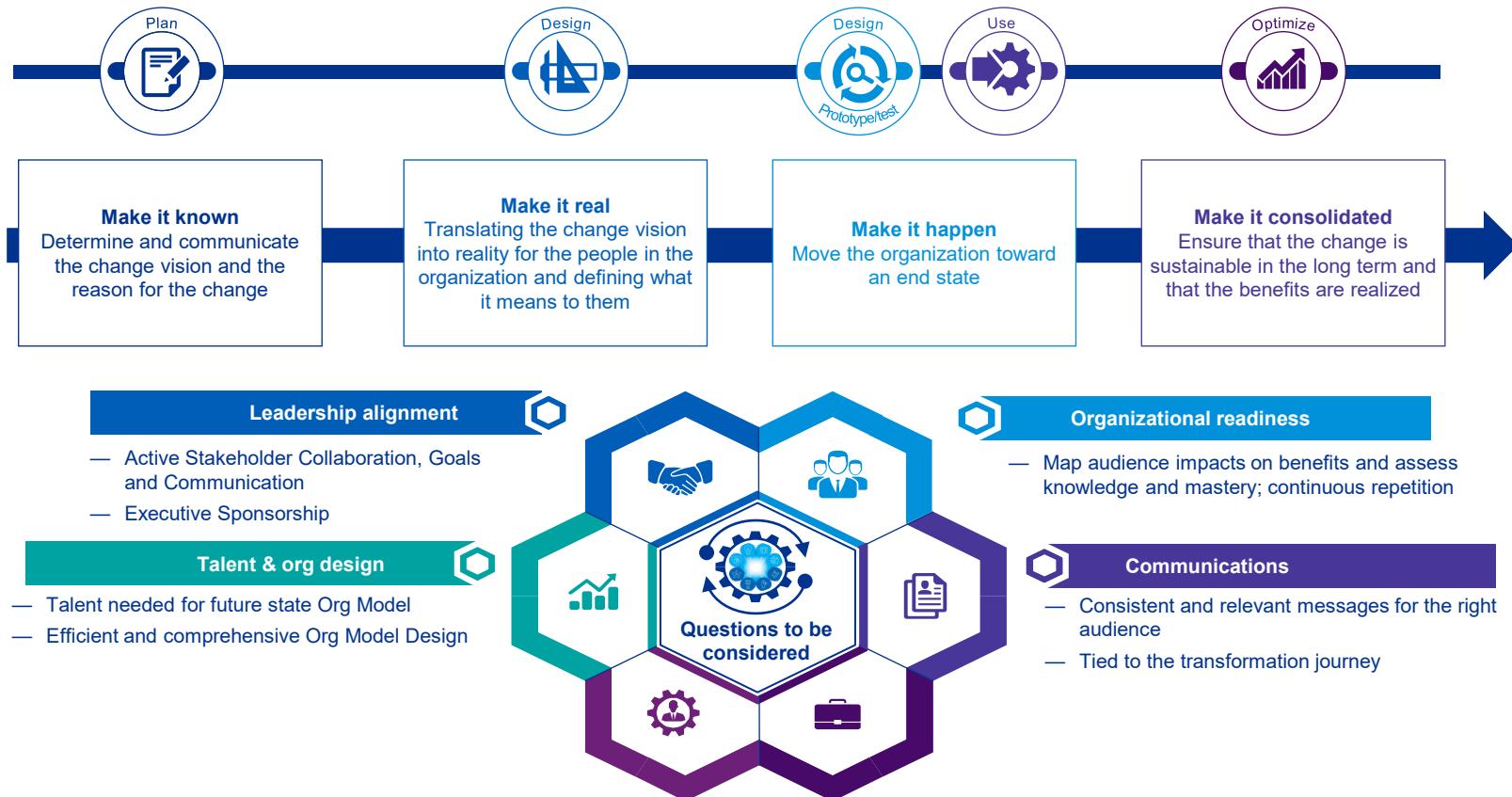
KPE approach seeks to clarify technology and emphasize how it can support business strategy based on leading KPMG practices

Sample of Deliverables

Template	Description
Solution Strategy	<ul style="list-style-type: none"> — A document that defines the organization's strategic goals and objectives, leveraging industry best practices and KPMG expertise to develop short-term and long-term guiding principles — The solution strategy will guide you through scoping, evaluation, and selection of the vendor solution, as well as through the design and development of the implementation plan
Business and Technical Requirements	<ul style="list-style-type: none"> — Unique requirements for business and IT, which are identified through interviews and workshops with key stakeholders — A detailed strategy and plan for developing project communications to have strategic and tactical communications during collaboration
RFP / Vendor Scoping Document	<ul style="list-style-type: none"> — The RFP document is a formal communication with the vendor that contains background and provides information to the vendor, including solution strategy and business/technical requirements — Vendors must respond to the RFP by a defined date and comply with the requirements expressed in the document
Vendor Demo Workshop Use Cases	<ul style="list-style-type: none"> — Our methodology for developing cases focuses on identifying real-world business scenarios where providers can actually apply their solution to demonstrate how they can deliver the required services — Cases are structured to understand unique requirements and encourage providers to differentiate themselves and their solution
Vendor Scorecard	<ul style="list-style-type: none"> — The provider evaluation scorecard provides a central repository to aggregate and tabulate the score related to provider responses — Assessment categories and their respective weights can be defined based on management's request or using KPMG standards
Implementation Roadmap	<ul style="list-style-type: none"> — Provides a high-level roadmap and implementation of initiatives to guide the development of the target solution — Highlights the activities and interdependencies required to carry out the necessary implementation initiatives — The plan will include technical and organizational transaction requirements and coordinate communication efforts

What is Change Management Approach

Successfully using ERP systems to support the business transformation enabled by technology requires the following change management activities.



Agenda

1. KPMG Advisory – IT Advisory Enterprise Solution
2. From Legacy systems to ERP systems (historical evolution)
3. How ERP systems are made (levels, environment)
4. The introduction of an ERP system in the company
5. SAP: sample of ERP system
6. ERP Projects
7. Recommended Approach
8. Discussion



Thank you



Some or all of the services described here may not be permitted for KPMG Audit Clients and their affiliated or related entities.



kpmg.com/socialmedia

© 2023 KPMG Advisory S.p.A. è una società per azioni di diritto italiano e fa parte del network KPMG di entità indipendenti affiliate a KPMG International Limited, società di diritto inglese. Tutti i diritti riservati.

Denominazione e logo KPMG sono marchi e segni distintivi utilizzati su licenza dalle entità indipendenti dell'organizzazione globale KPMG.