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**BUSINESS PROCESS IMPROVEMENT OF THE SYSTEM INTEGRATOR  
COMPANIES THROUGH A CASE STUDY ANALYSIS**

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**ABSTRACT**

The innovative information technology (IT) solutions represent the essential business platform for improvement and redesign of business processes within a specific organization. This paper shows the impact of modern IT solutions on the business processes towards improving their quality and effectiveness. For this purpose, the paper introduces the appropriate methodology and analyzes the effects of the implementation of the new IT solutions within the system-integrator companies.

In the framework of the presented methodology, an analysis of the strategic position of the system-integrator-companies is conducted, along with the identification of the weaknesses of the companies and analysis of the key existing business processes (AS-IS). Towards managing the defined weaknesses, the key processes are appropriately adjusted, redesigned and improved (TO-BE). For the constant quality maintenance and improvement of the business processes, the appropriate ISO quality systems are implemented. In this manner, the business processes can be significantly improved and adapted to the needs of the organization, through the optimization of the information solutions and technology.

**KEYWORDS:** information technology solutions, system-integrator companies, King ICT company, business process, ISO standards

**JEL CLASSIFICATION:** O31, O33

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## **1. INTRODUCTION**

The information technology (IT) solutions are the core tools for managing the business processes and the business data, and represent the most important component of the organizations, regardless of their type, size and the industry the organization belongs. The quality and the effectiveness of the data processing is directly dependent on the implemented IT systems. On the other hand, a system-integrator company is a company that specializes in bringing together component subsystems into a whole and ensuring that those subsystems function together, a practice known as system integration. They also solve problems part of business process redesign and automation. System-integrators may work in many fields, but the term is generally utilized in the IT industry. The quality issues of business data represent an important part of the work of system-integrators.

Modern companies dispose unstructured and large volume of business data, known as big data. In fact, every organization is facing issues with related management of big data. According to Gartner, big data is defined as “high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and business process redesign and automation”<sup>1</sup>. Thus, the success of the organization is depending on the level of quality and effectiveness of data processing. Thereby, the achievement of organizational objectives is directly depending on their implemented IT processes for data collection, processing and transferring.

It should be stressed out that big data faces huge challenges around privacy, especially with the new privacy regulation by the European Union. Companies are forced to address the ‘elephant in the room’ around their privacy controls and procedures. The Gartner Group (2015) predicts that by 2018, 50% of business ethics violations will be related to data, and by 2020, predictive and prescriptive analytics will attract 40% of enterprises' net new investment in business intelligence and analytics. Consequentially, by 2020, new software application and data predictive analytics solutions will be developed<sup>2</sup>.

This paper presents the essential characteristics of the system-integrator companies and their strategic market positioning. The strategic positioning of the

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<sup>1</sup><http://www.gartner.com/it-glossary/big-data/>

<sup>2</sup><http://www.gartner.com/newsroom/id/3165317>

system-integrator companies is analyzed based on Michael Porter's model. The effects of the implementation of the new IT solutions within the system-integrator companies are also analyzed, through a real-case of the specific system-integrator company, KING ICT. Besides the strategic positioning of the company, the analysis encompasses the company's profile description, business portfolio and core business description as well.

## **2. STRATEGIC POSITIONING AND THE BUSINESS PROFILE OF THE SYSTEM- INTEGRATOR COMPANIES**

### **2.1 Strategic positioning**

The strategic positioning of the system-integrator companies is analyzed and defined based on the Porter's Five Forces framework model. Through this model the five key forces are defined, as most influential factors on the companies and their environment on the Macedonian IT market (Harmon, 2007). The identified forces are as follows:

1. **The competitive rivalry (market competition).** According to the conducted analysis, regarding the related force, i.e. factor, the main market threats to the system-integrator companies are the foreign investments as anew competition in the Macedonian IT market along with the disloyal competition.

2. **The suppliers power (distributors, partners).** The competitiveness of the solutions of system-integrator companies is directly dependent on the strength of its suppliers. In the vain of increasing their competitive advantage, productivity and efficiency on the Macedonian IT market, system-integrator companies have strong partnership with distributors and vendors of quality IT technology (equipment, solution and services).

3. **The buyer power (customers, clients, consumers, purchasers).** The buyer power is increasing along with the competitions growth on the market. Regarding this force, system-integrator companies are decreasing the buyer power on the Macedonian market through adaptation, adjustment and offering of the already implemented solutions in the region. From a financial perspective, these solutions are partially settled, which allows to the companies to offer more competitive prices on the Macedonian market.

**4. The threat of substitution (new products on the market – substitutes).**

According to the theory of Porter, the threat of substitutes is a threat of replacing a product or service with adequate but more competitive one or with an appropriate alternative from another industry. In order to answer to this challenge, system-integrator companies have established (and have been establishing) partnerships with various suppliers and producers of ICT equipment, solutions and services. This strategy gives an opportunity to be present on the Macedonian IT market with a variety of products and services, which in fact are substitutes to each other.

**5. The threat of new entry (new potential competitors).** Recently, within the system-integration business segment of the Macedonian IT market, new competitors could be expected because of the new domestic and foreign investments.

## **2.1 Business profile**

The core business domain of system-integrator companies is delivery and implementation and integration of IT business solutions, as well as providing respective IT services and support. The integration of various IT systems enables their unified functionality as one single IT platform (Prencipe et al., 2004). The general aim of the integration is the implementation of automated process for import of various data types (input data), their automated processing and sublimation (data processing), towards automated exporting of the respective results (output data) (Scheer, 2000).

In this paper, the methodology for installation, implementation and integration of various new IT solutions as single unified IT platform is elaborated on the real case of the system-integrator company KING ICT. According to the available official financial statements, KING ICT is ranked as one of the largest system integrators in the region<sup>3</sup>. The implementation of the integrated IT solution, results in significant efficiency and effectiveness improvement of the KING ICT core business.

The service portfolio of the KING ICT company includes consulting services, services for information systems dimensioning, services for development and implementation of IT solutions and ICT infrastructure systems, technical support and maintenance, and appropriate education for delivered solutions. According to the company's policies, the development and implementation of the IT solutions,

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<sup>3</sup><http://www.banka.hr/tko-su-najvece-hrvatske-informaticke-tvrtke/print> (accessed on 12.11.2016)

providing the related IT services, the projects managing and the customer care, always have to be of the highest quality level. Thus, the business processes based on which the company methodology is underlying, must continually analyze and improve. Business processes improvement is usually done through implementation of the appropriate information systems, such as Customer relationship management (CRM); Time Sheet; Document management system (DMS); and Service desk system.

The implementation of the appropriate information systems was done on the ISO quality systems (standards), such as ISO 9001 Quality management system<sup>4</sup>; ISO 20000 IT service management system<sup>5</sup>; and ISO 270001 Information security management system<sup>6</sup>.

KING ICT disposes a broad portfolio, consistent of IT solutions and services. The portfolio is defined based on the following principles:

- **Technological expertise**, which includes continuous education of the personnel; certification by the global technology partners; and balanced portfolio (HW, SW, services).

- **Improving business processes** through the implementation of the quality standards, quality management system; system for environmental management; IT service management system; information security management system; and international business methodology application.

- **Research and development** through inclusion of the world IT leaders solutions (Microsoft, IBM, EMC and others); development and implementation of custom and own solutions; and solution integration.

- **Customer centricity** which includes relationship management with the customers; customer support; and business analysis of the market requirements. The portfolio can be segmented according to various criteria (type, HW, SW, brand, purpose etc.). The KING ICT portfolio is divided into four main groups. Every group contains particular type of solution<sup>7</sup>:

- **Business process management** which includes ERP - Base Business Processes; Document Management System; and Satellite Technology Based Solutions.

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<sup>4</sup>[http://www.iso.org/iso/iso\\_9000](http://www.iso.org/iso/iso_9000) (accessed on 23.12.2016)

<sup>5</sup>[http://www.iso.org/iso/catalogue\\_detail?csnumber=51986](http://www.iso.org/iso/catalogue_detail?csnumber=51986)(accessed on 23.12.2016)

<sup>6</sup>[http://www.iso.org/iso/catalogue\\_detail?csnumber=63411](http://www.iso.org/iso/catalogue_detail?csnumber=63411) (accessed on 23.12.2016)

<sup>7</sup><http://www.king-ict.com/en/ict-solutions> (accessed on 17.04.2017)

○ **Employees Management and Human Resources Development**

which includes Human resources management system; Fleet management system; and Learning process management system.

○ **Infrastructure management** which includes Construction and IT

infrastructure optimization; Data centers; Security management system; and Automation systems and energy efficiency.

○ **Information management which includes** Sales plan design and

monitoring; Information security management; and Business reporting systems.

The portfolio is constantly improving and upgrading with new solutions and services. Based on the gained experience of the in-house implementation and integration of the Dynamics MS CRM, aktivManager DMS, BI, Time Sheet and KSL Service Desk system, KING ICT practically, have expanded the own portfolio with the mentioned solutions, IT consulting services and services for business analysis.

### **3. IMPLEMENTATION OF AN INTEGRATED IT SYSTEM**

The previous section describes the core business of the system-integrator companies. In order to clearly present the core business of these companies, a case study is conducted, where the integration and implementation process of the various solution within the KING ICT environment as well as the main benefits of the integrated IT system are analyzed.

Based on the analysis, KING ICT has identified the weaknesses of the company and the needs of implementation and integration of appropriate IT solutions. The purpose of the implementation of these solutions into one single integrated IT system was improving the company's core business.

The implementation of the integrated IT system was realized in three main phases:

- Consolidation of the ICT platform and virtualization;
- Implementation of company (private) cloud;
- Implementation of an integrated ICT system (integration of the IT solutions).

#### **3.1 ICT platform consolidation**

The consolidation of the ICT platform represents the initial phase. This consolidation includes virtualization of the company's hardware infrastructure, which

provides reliable, confidential and redundant IT platform to the KING ICT. The virtual platform is the centralized foundation of the computer cloud environment, which unifies and integrates the company's IT solutions and tools. The cloud incorporates all of the employees' IT tools, which are utilized by the personnel to perform their daily business activities (Grant and Meadows, 2016).

The general benefit of the virtualization is the reduction of the hardware equipment. The hardware reduction results in significant decrease of the high electricity costs and the costs for maintenance of the whole equipment. Thus, through the virtualization, the company's total cost of ownership (TCO) was significantly decreased (Thomas at al, 2013).

### **3.2 Cloud computing implementation**

The implementation of the cloud computing technology enables central access to the IT tool, regardless the time, place or device (thin client, smart phone, tablet etc.) (Buyya at al, 2011). According to the company policies, each employee has particular privilege to access and use appropriate IT solution. Depending on the privilege, the employee can access to an appropriate IT tool or only to a specific functionality of it (Slack and Wise, 2014).

The KING ICT computer cloud incorporates and integrates the following existing and new IT solutions:

- ERP System (existing);
- CRM System (new);
- DMS System (new);
- Time Sheet (new);
- BI (business intelligence) System (existing);
- KSL Service Desk System (new).

The implementation of the computer cloud results in significant improvement of the reliability and confidentiality to the company critical data (Asha, 2012).

### **3.3 Integration of IT solutions**

The integration of the solutions enables automated process of data processing and exchange as well as export of various ad-hoc and predefined reports and

analyses(Reid, 2012). Below is presented the project managing process which involves data processing by several IT solutions and employees. This example includes all of the previously mentioned integrated IT solutions.

- **User registration in CRM:** Users' database is being created via CRM (employees, distributors, subcontractors, business partners, customers etc.)
- **Offer preparing in ERP:** The offers are being created via ERP (for the clients' purpose). The ERP is importing the data information for the appropriate client directly from the CRM database.
- **Project registration in CRM:** Based on the accepted offer (created via ERP), the project is being created via CRM (the project includes all of the respective offer's data)
- **Financial and accounting in CRM:** Each registered project in the CRM is being connected with the ERP. The income and outcome invoices related to that project, are being imported via CRM, and thereafter are being processed via ERP.
- **Milestones and WBS registration in CRM:** The engaged resources and related activities (WBS) are being created via CRM.
- **Employee time tracking in Time Sheet:** this solution enables access (to each involved employ) on the respective project and tracking the spent time for each single WBS, previously created via CRM. The spent time (by the related employees) on the predefined project tasks (WBS) is being recorded via Time Sheet.
- **Time tracking expense processing in ERP:** the tracked time in the Time Sheet, through CRM is being processed via ERP. The expense is being calculated via ERP and it is being registered as appropriate project cost (on the respective project) via CRM.
- **Support and maintenance project registration in KSL:** The KSL system is applying on projects (previously registered in CRM) which are under support and maintenance by the KING ICT. The support and maintenance activities on these projects are being managed via KSL system.
- **Document managing in DMS:** the whole related project documentation is being managed via DMS. The income invoices are being digitalized and

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approved via DMS. DMS. The digitalized documentation is storing to the related project into CRM.

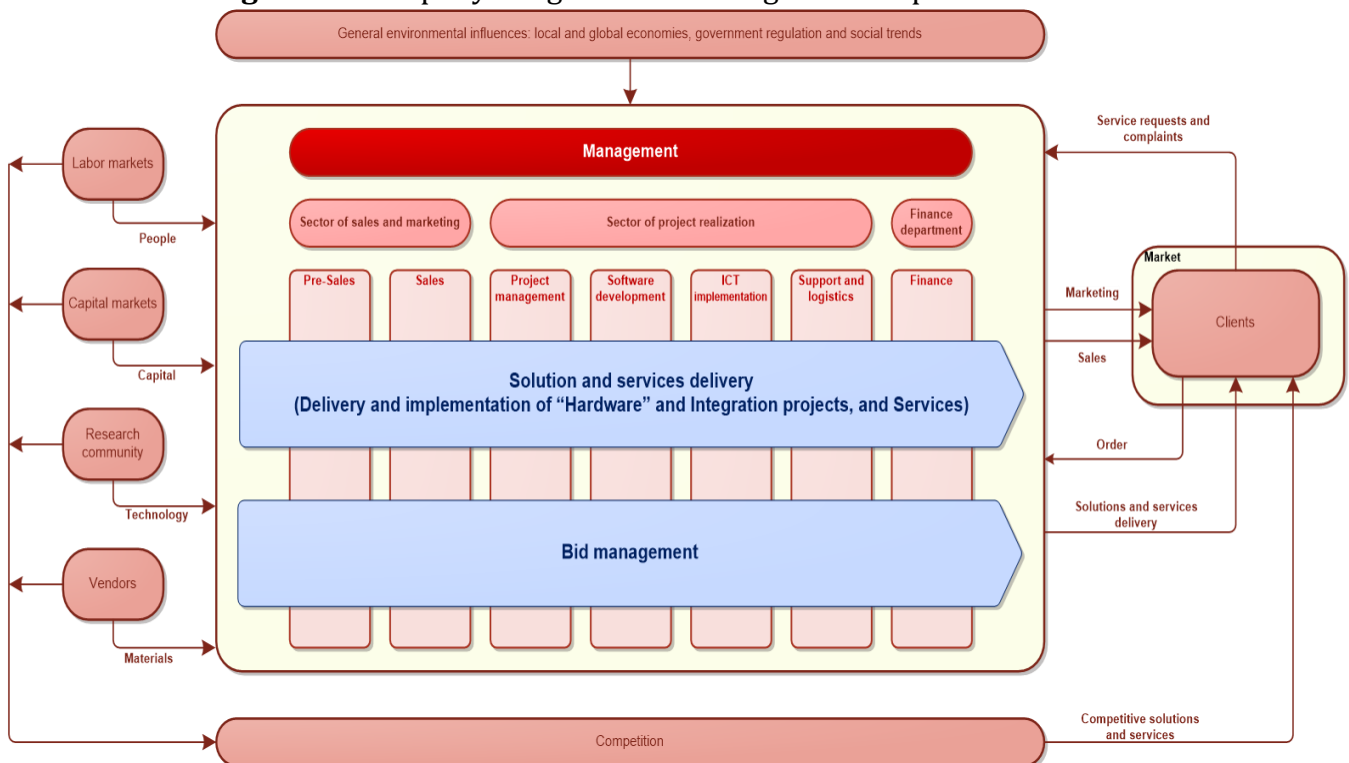
- **Financial reporting:** The BI (business intelligence) system is analyzing the financial data, previously processed via ERP. The BI system exports ad-hoc and predefined financial reports, based on numerous criteria (projects, project type, costs type, customer etc.)

The integration of the IT systems and solutions enables effective and efficient business. Based on the opportunities provided by the innovative technology, KING ICT has consolidated and significantly improved the company's core business processes (Prencipe et al, 2005).

### 4. ANALYZING THE PROCESS ARCHITECTURE

On the diagram given below, the process architecture diagram of the analyzed company KING ICT is presented. The diagram presents the structure of the company's core value chains and the company's organization positioning (Harmon, 2007). Additionally, the diagram presents the environmental impact to the company, company's inputs as well as respective outputs.

**Diagram 1.** Company's organizational diagram of a specific value chain



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**Source:** Paul H. (2007), "Understanding the Enterprise", Business Process Change, Second Edition: A Guide for Business Managers and BPM and Six Sigma Professionals (The MK/OMG Press), Elsevier/Morgan Kaufmann Publishers, Burlington, USA

KING ICT is departmental structured, consisted of:

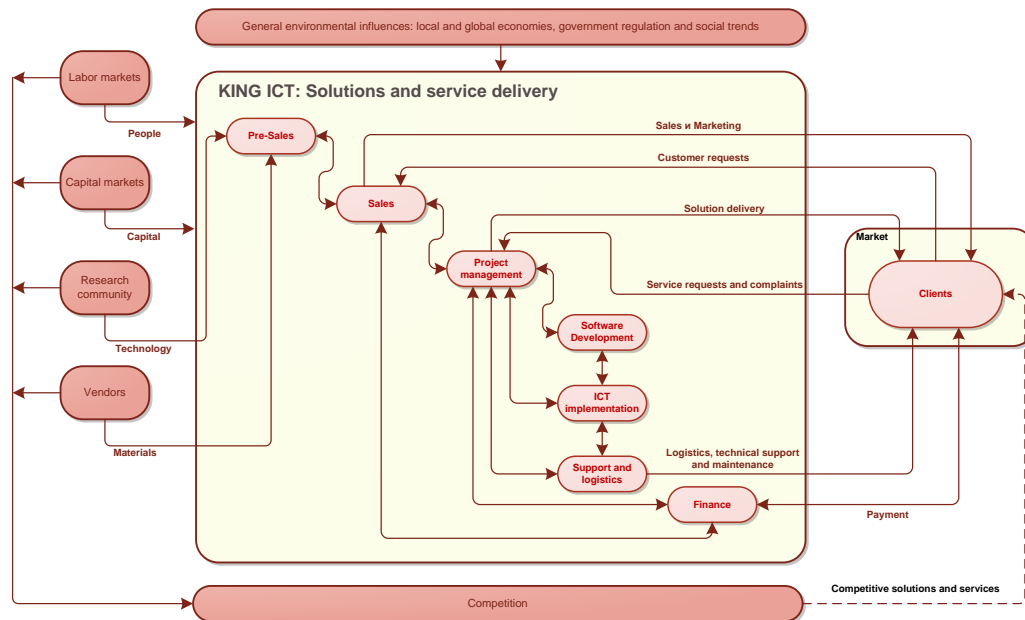
- Pre-sales department
- Sales department
- Project managing department
- Department of software development and deployment
- Department of ICT implementation
- Support and logistics department
- Finance department

The company's core value chains are crossing through the previously mentioned departments. KING ICT has identified two core value chains with their related processes, respectively:

- Delivery of solution and services (delivery and implementation of hardware, integration projects and services):
  - Process: "Hardware" – delivery and implementation of "hardware" segmented projects;
  - Process: "Software" – delivery and implementation of integration projects (hardware and software implementation and integration) or software development projects;
  - Process: "Services" – service delivery, technical support and maintenance (within the projects or as particular customer's demands);
- ▶ Bid management
  - Process: Pre-sales;
  - Process: Sales;
  - Process: Marketing.

In this paper, we take into consideration the first value chain – Delivery of solution and services. The organizational diagram with the mentioned value chain is presented on Diagram 2.

**Diagram 2.** Company’s organizational diagram on Solutions and service delivery

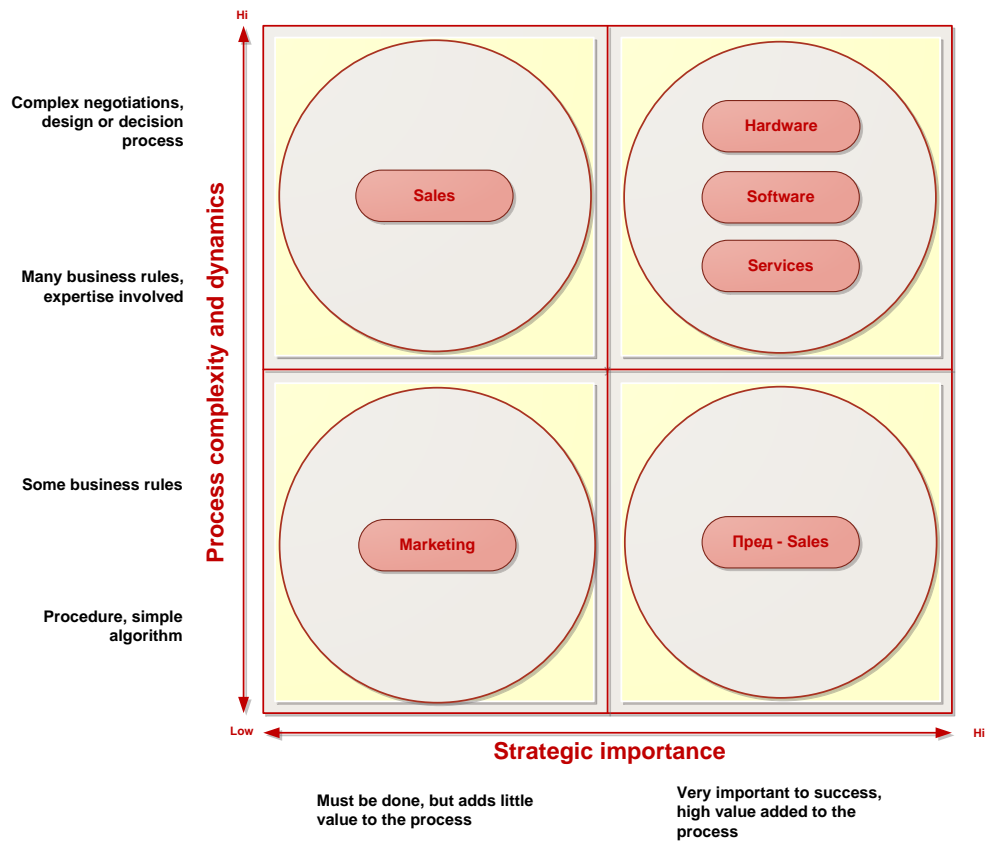


Source: Paul H. (2007), “Understanding the Enterprise”, Business Process Change, Second Edition: A Guide for Business Managers and BPM and Six Sigma Professionals (The MK/OMG Press), Elsevier/Morgan Kaufmann Publishers, Burlington, USA

#### 4.1 Matrix of the process complexity and strategic importance

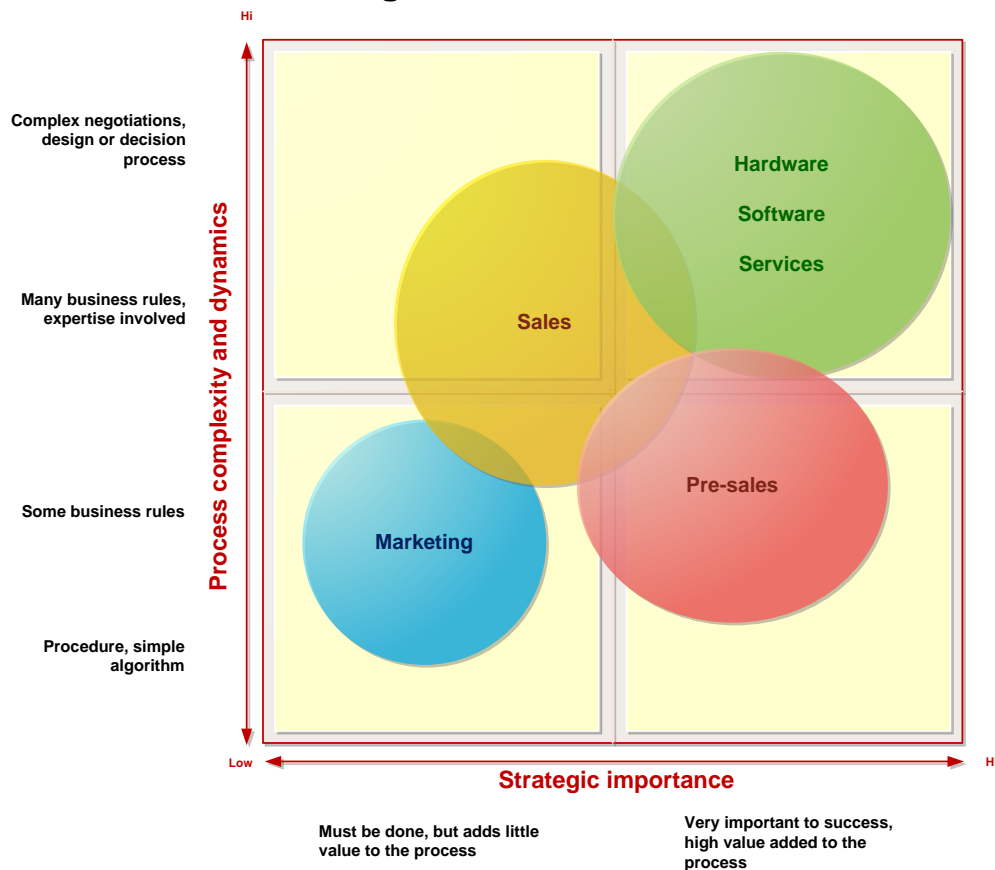
The business processes can be measured by their complexity and strategic importance to the company. On diagrams 3 and 4 are given two matrixes related to KING ICT value chains. The matrixes present the core business process referred to their complexity, dynamics and strategic importance within the company (Harmon, 2007).

**Diagram 3. Process complexity and strategic matrix**



Source: Paul H. (2007), "An Executive Level BPM Group", Business Process Change, Second Edition: A Guide for Business Managers and BPM and Six Sigma Professionals (The MK/OMG Press), Elsevier/Morgan Kaufmann Publishers, Burlington

**Diagram 4. Generic solution matrix**



Source: Paul H. (2007), "An Executive Level BPM Group", Business Process Change, Second Edition: A Guide for Business Managers and BPM and Six Sigma Professionals (The MK/OMG Press), Elsevier/Morgan Kaufmann Publishers, Burlington

**4.2 AS-IS and TO-BE business processes diagrams**

The AS-IS diagram presents the initially implemented business processes within the KING ICT company. The diagram involves all of the processes which are contained to the most important value chain to the company - Delivery of solution and services. The TO-BE diagram presents the redesigned and improved business processes, based on the AS-IS processes, respectively (Harmon, 2007). Currently, within KING ICT, the TO-BE processes are being implemented. The business processes redesigning and improving are directly supported by the implementation of the new modern IT solutions and their integration with the existing ones. Thereby, the implementation and integration of the IT solutions within the KING ICT company is enabled by the usage and application of the core information technologies such as virtualization and cloud computing.

Thus, the conclusion is that the business process improvement is directly depending on the used and implemented information technologies and solutions. The

optimal usage and incorporation of the innovative IT technology results with significant business improvement within the company. The AS-IS and TO-BE diagrams of the most complex process: "Software" – delivery and implementation of integration projects (hardware and software implementation and integration) or software development projects, are given as appendix.

## **CONCLUSION**

The quality of the business, the market competitiveness and the success of organizations directly depends on the implemented business processes. The flexibility of the organization is the essential element in defining the strategic market positioning towards improving their business processes and efficient managing. Also, the key point is the recognition of the opportunities offered by the modern information technology as core platform for implementation and support of the redesigned business processes towards achieving the company's strategic objectives. This paper presents the improvement of business processes in the company KING ICT by implementation of the modern information technologies and IT systems. According to the official statistical records, the usage of the IT systems for automated data processing (ERP, CRP, BI etc.) into Macedonian information society is constantly increasing. The presence of the leading information technology vendors (IBM, HP, Microsoft, SAP, etc.) have strong impact on the local companies and organizations in the usage of previously mentioned solutions.

KING ICT, as system-integrator company, has recognized the opportunities and the benefits of the implementation of the modern IT solutions. Thereafter, the company has conducted appropriate analysis for weakness identification within the existing business processes. The analysis concluded inconsistencies within the existing processes for the project delivery management (delivery of "hardware", "software" (integration) projects and IT services). Based on the conclusion, KING ICT has established new business process values, i.e. the company has consolidated and redesigned the respective business processes. The business processes were redesigned and implemented upon the innovative IT system. In parallel with the business process improvement, KING ICT has implemented appropriate ISO standards for: quality management (ISO 9001), IT service management (ISO 20000) and Information security management (ISO 270001). These quality systems are fully

supportive and complement to the implemented IT systems. KING ICT, via implemented ISO standards, guarantees the quality of the business, effective project delivery and the security of the confidential data.

As elaborated in the paper, the integrated IT system is a complex solution, consisting of new and existing IT systems. The existing IT systems include ERP system; BI (OLAP) system; and Intranet, while the new IT systems include Customer relationship management system – CRM; Time Sheet; Document management system – DMS; and Service Desk system. These solutions are integrated and interconnected into one single unified integrated system. This system in fact represents the essential company's IT platform towards providing the business process automation in fully accordance with the abovementioned ISO quality standards.

The main benefits following the implementation of the new IT platform as well as the redesign of the respective business processes are:

- Effective management and automatization of the project delivery processes:
  - Delivery and implementation of “hardware” projects;
  - Delivery and implementation of integration projects (hardware and software implementation) or projects which includes only software development;
  - Delivery of IT services, technical support and maintenance (within the projects or as particular request by the customers);
- Improved business performances
  - Increased profit and cost reduction;
  - Increased confidence, satisfaction and loyalty by the clients;
  - Increased credibility and market competitiveness;
- Increased satisfaction and sense of belonging for the employees
  - Business automatization;
  - Minimized error risk;
  - Improved business efficiency;

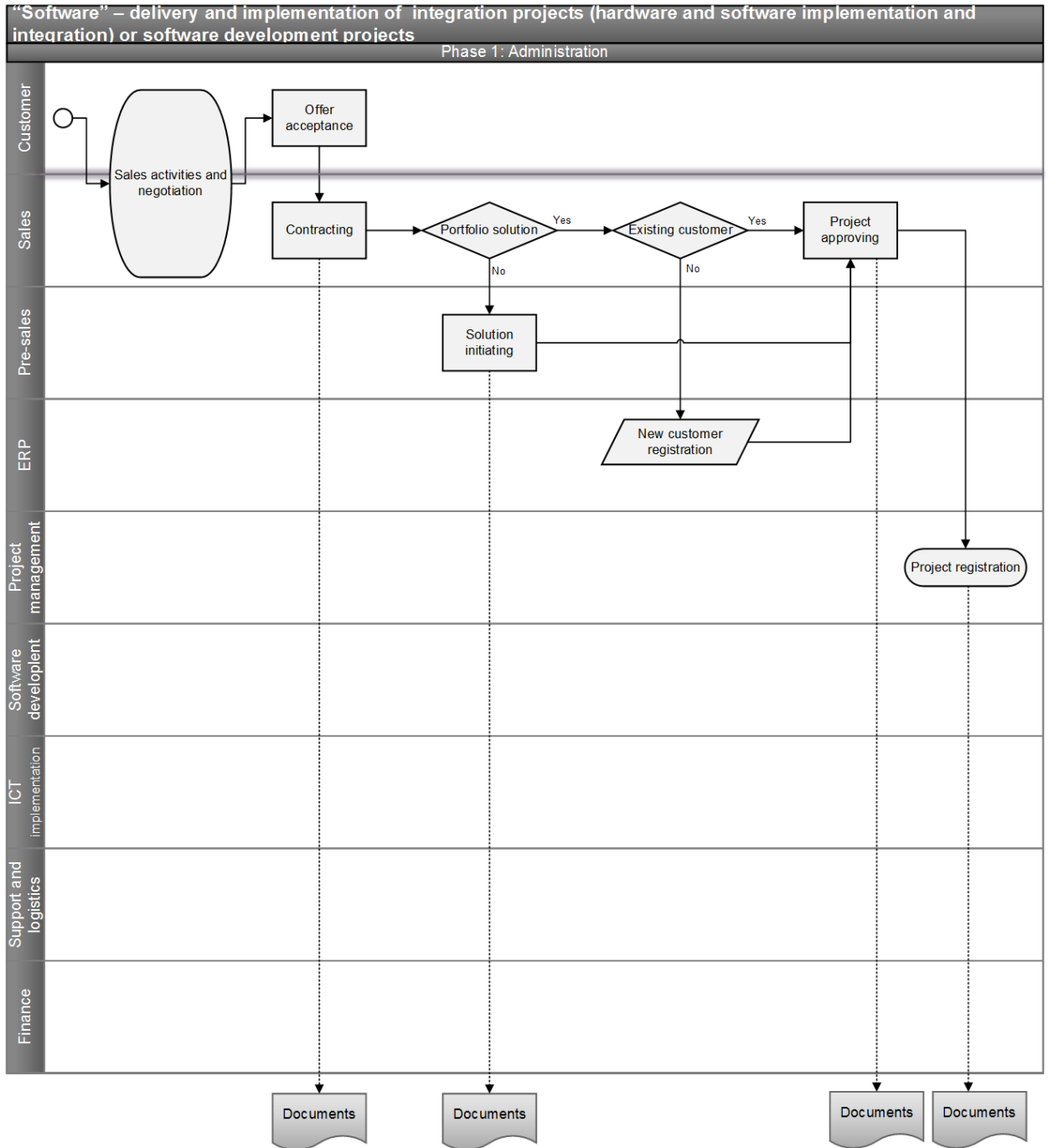
The summary of this case study is that the business processes and the information technology are interdependent and inseparable elements. The optimal usage of the IT solutions could result in maximum business process improvement in accordance to the organizations' needs towards accomplishing their strategic objectives.

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**Appendix**

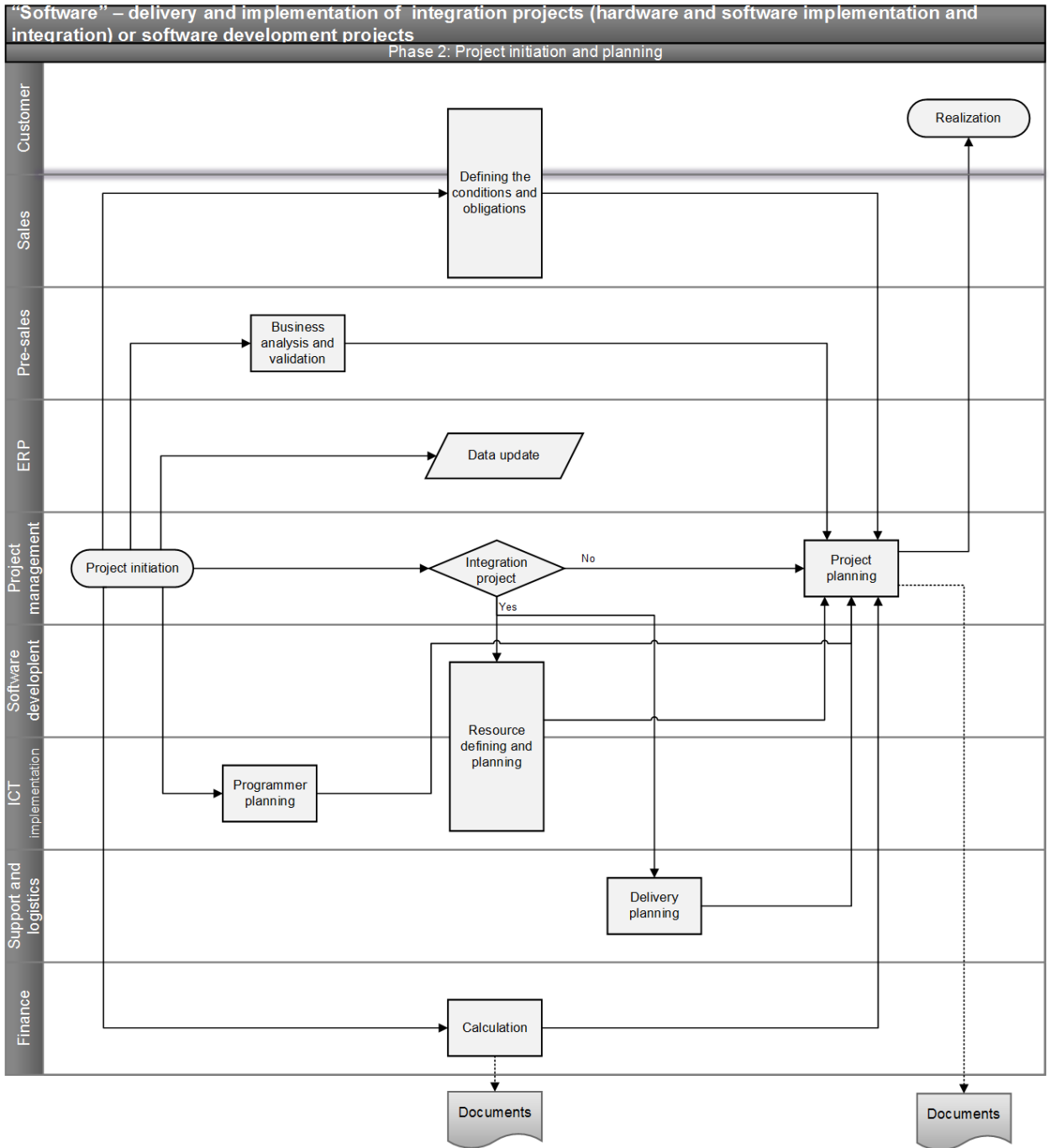
**AS-IS process diagram**

**Phase 1: Administration**



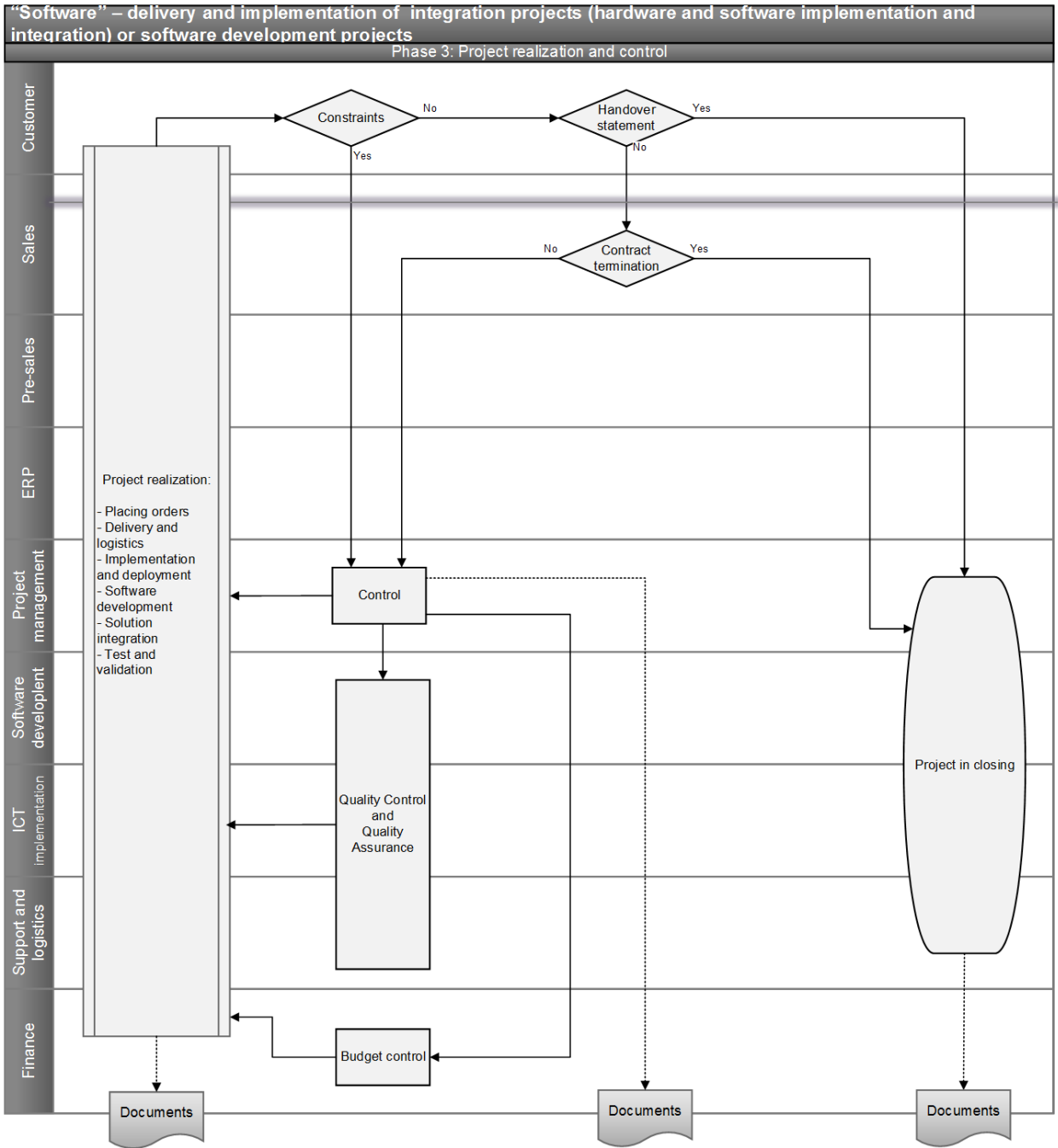
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**Phase 2: Project initiation and planning**



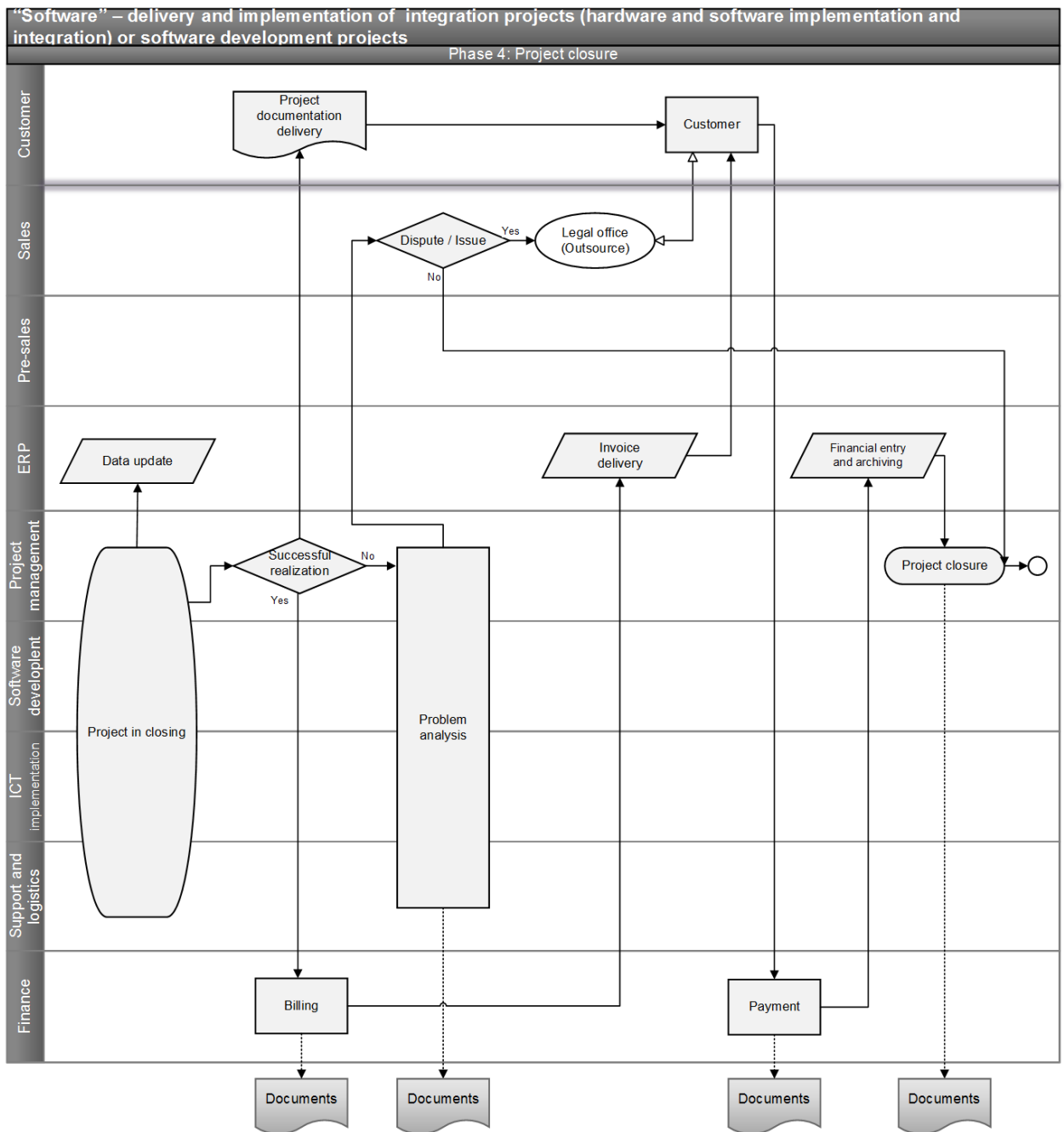
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**Phase 3: Project realization and control**



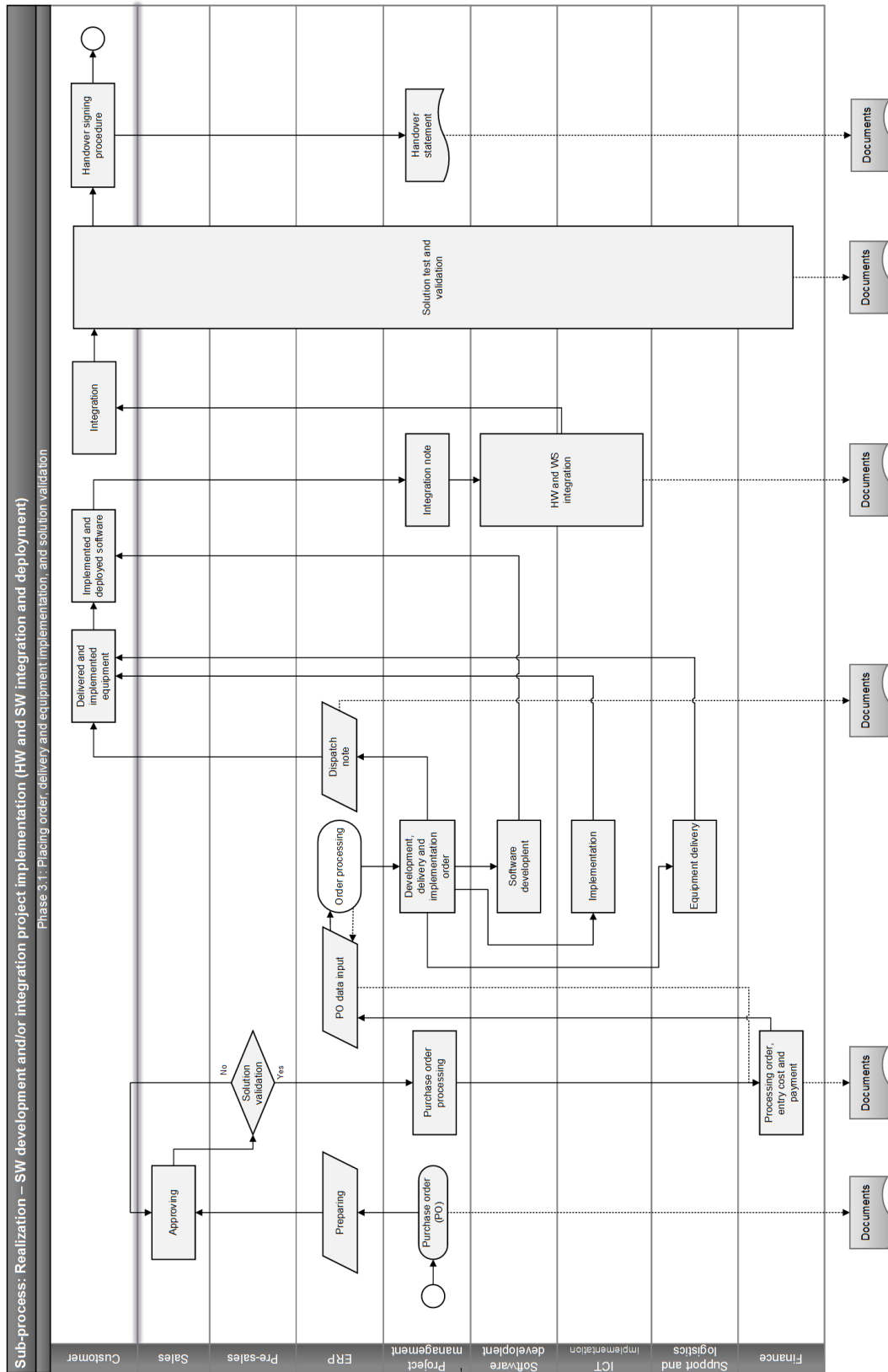
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## Phase 4: Project closure



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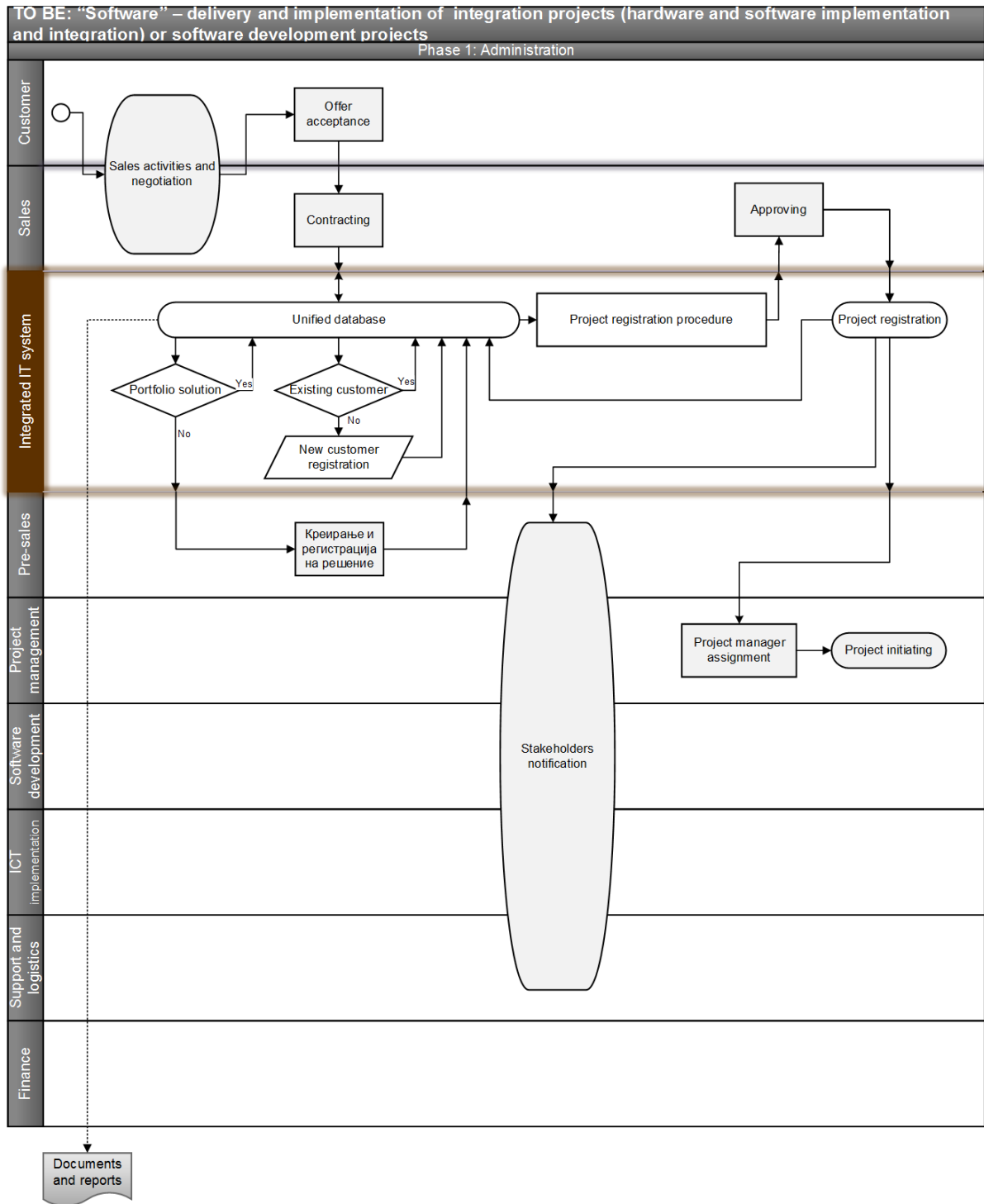
## Sub-process: Project realization



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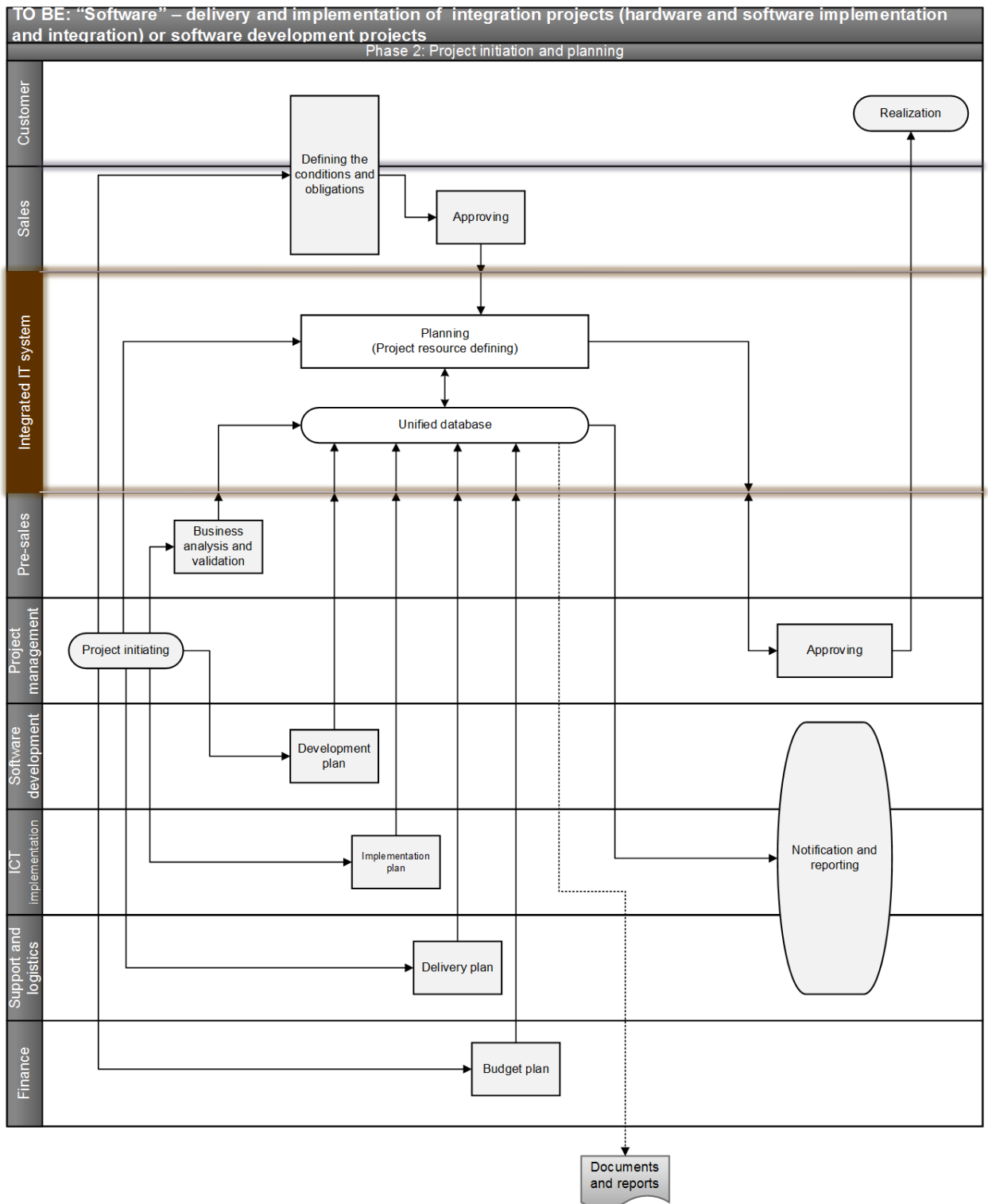
## TO-BE process diagram

### Phase 1: Administration



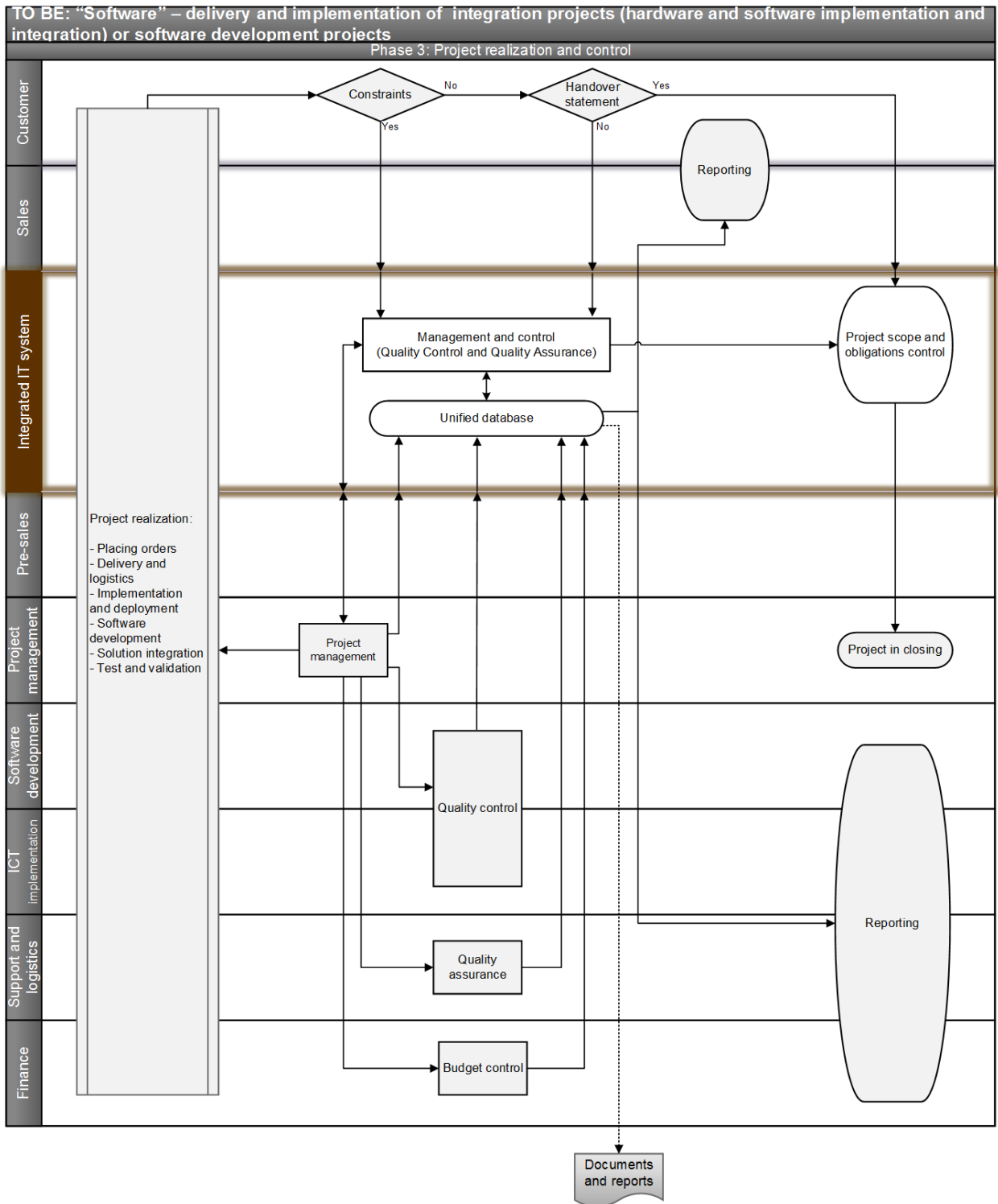
# BUSINESS PROCESS IMPROVEMENT OF THE SYSTEM INTEGRATOR COMPANIES THROUGH A CASE STUDY ANALYSIS

## Phase 2: Project initiation and planning



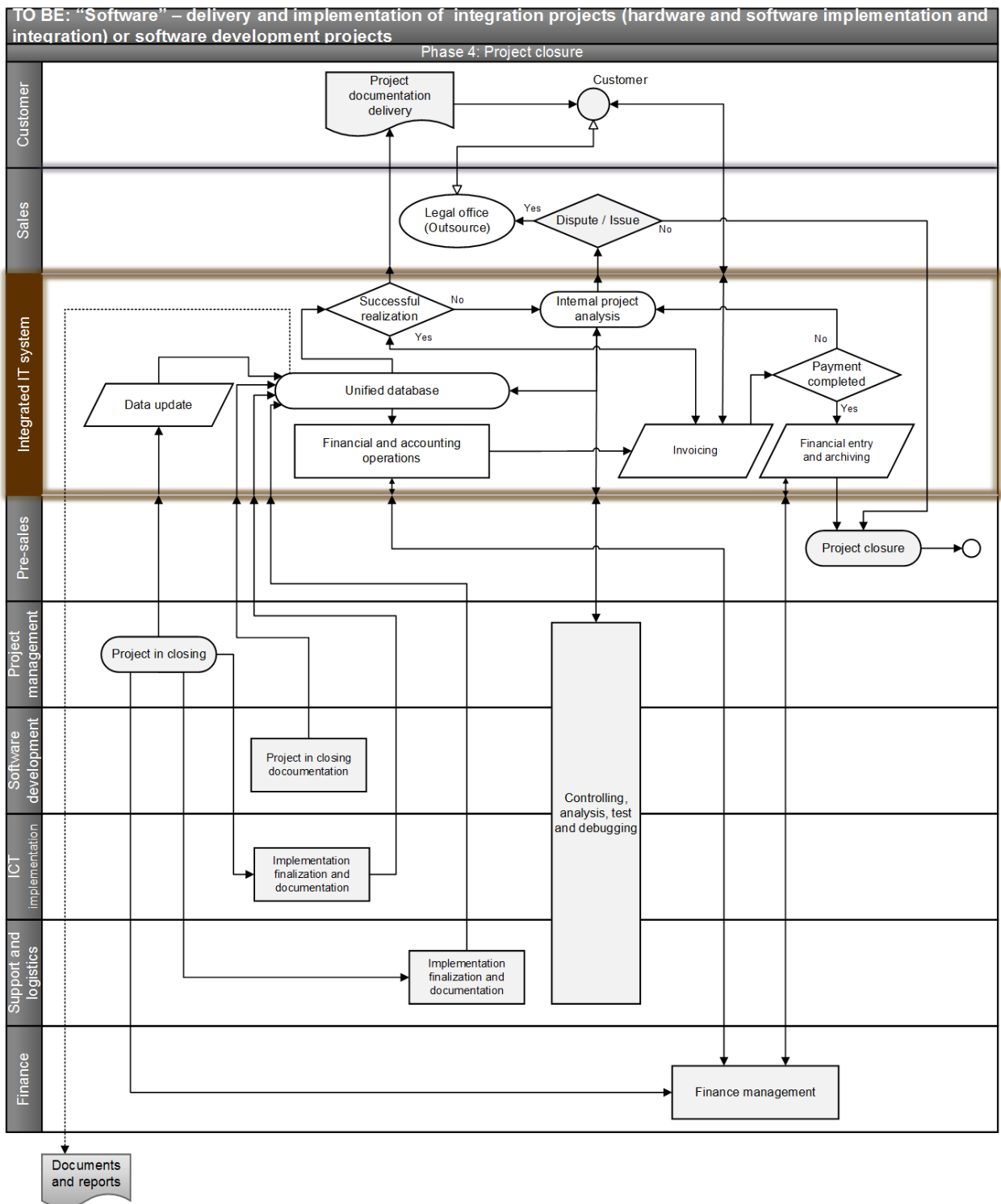
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**Phase 3: Project realization and control**



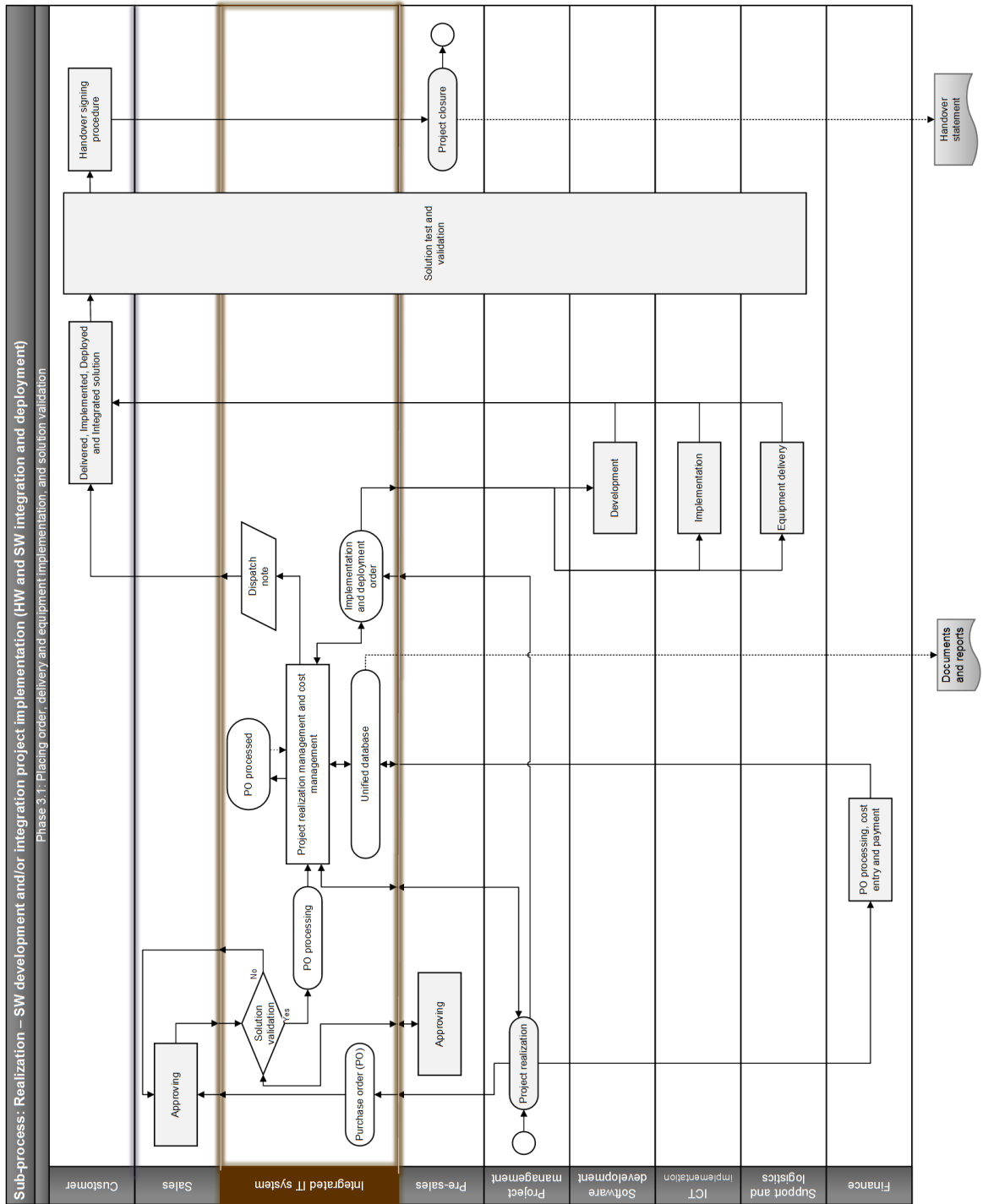
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## Phase 4: Project closure



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## Sub-process: Realization



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