

# Transformation of business process management system through digitalization: a case of Infobip

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**University of Zagreb**  
**Faculty of Economics & Business**  
**Managerial Informatics**

**TRANSFORMATION OF BUSINESS PROCESS MANAGEMENT  
SYSTEM THROUGH DIGITALIZATION: A CASE OF INFOBIP**

**Master Thesis**

**Ivana Kolić**

**Zagreb, September 2021**

**University of Zagreb**  
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SYSTEM THROUGH DIGITALIZATION: A CASE OF INFOBIP**

**Master Thesis**

**Ivana Kolić**

**Course: BPM**

**Mentor: professor Ljubica Milanović Glavan, PhD**

**Index number: 0067561472**

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In Zagreb, September 2021,

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Student signature:

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And I would especially like to thank my parents, sister, and boyfriend for their great support, faith in me, and patience. Without them, this time would have been much longer. So a big thank you to them for being with me since my first college day in Zagreb.

## **List of acronyms**

AI – Artificial Intelligence

AR – Augmented reality

BAM – Business Activity Monitoring

BI – Business Intelligence

BPM – Business Process Management

BPMN – Business Process Model and Notation

BSC – Balanced Scorecard

CRM – Customer Relationship Management

DESI – The Digital Economy and Society Indeks

DT – Digital Transformation

GSM – Global System for Mobile Communication

ICT – Information Communication Technology

IDT – Instructional Design and Technology

IoT – Internet of Things

IT – Information Technology

KPI – Key Performance Indicator

OKR – Objective and Key Result

OMG – Object Management Group

PCI DSS – Payment Card Industry Data Security Standard

VR – Virtual reality

## **Abstract**

Without digitalization, today's World could hardly function. Digitalization drives our communication, business, services, and the entire World in which we live. This paper will describe what digitalization is and in what ways digital transformation has contributed to companies. There will be a general discussion about the business process management system and how it helps and contributes. In addition, it is stated how they are interconnected and how they work together for the success of a company. At the end of the paper, a company that uses a high level of digitalization, Infobip, is mentioned. It will describe how Infobip achieved a high level of success and how digitization helped.

**Key words: digitalization, digital transformation, digital era, business process, business process management system, Infobip**

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# 1. INTRODUCTION

Nowadays, without technology, we can hardly live. In addition to the fact that we need our mobile devices, everyone has the option of accessing the Internet. Technology is evolving so much that we as humans are failing to keep up with it so quickly. Of course, some countries manage to follow the technology and develop along with it, while there are also those countries that are less developed. This paper will write about the changes in digitalization and how it has affected the development and management of business processes. Otherwise, we can define digital transformation as a process that begins when the organization starts thinking about introducing digital technologies in all areas of business and lasts until the moment of their full integration. This paper will talk about the company Infobip, which started its business with a low level of digitalization and today operates with a very high level of digitalization. Digitization contributes a lot, such as more accessible business, faster business, more educated employees, better business control, and lower costs, both for individual companies and networks of related companies.

## *1.1. The subject and purpose of the paper*

The purpose of the thesis will be the impact of the transformation of business process management through digitalization. In addition, the thesis will cover a case study on a company that operates with a high level of digitalization – Infobip. The aim is to clearly define what business processes are, how they are managed, how digitalization helps, and how they are interconnected. It also explains the introduction of digitalization in companies and the advantages and changes in a particular company. Companies are more productive and efficient since the introduced digitalization, there is less possibility of mistakes, and the work is done faster.

## **1.2. *Sources and methods of data collections***

To do the research as well as possible, various sources will be used. Professional literature includes professional books, scientific articles, presentations, strategic documents, and various business sites.

Various literature can be found online and in libraries. In addition to the books that the Author will use, the personal acquaintance of the people who work in the company Infobip will make the information more accurate and precise.

## **1.3. *The content and structure of the paper***

This thesis consists of five sections. The first chapter begins with the definition of Business Process Management, then its importance and the impact of its advantages and disadvantages. Then the types of Business Process Management KPIs are listed, followed by Business Process Management Meta-model and next to it Meta-model with KPI extension.

The third chapter begins with the importance of digitalization in business processes. It describes how the digital transformation came about. It also explains how business process management is related to digitalization, how digitalization affects companies, which innovations are used as new technology, and which changes occur through digitalization.

In the fourth chapter, it is stated how Business Process Management through digitalization in Infobip is affected. Then explain how they started their business, what advantages digitalization has brought them, and the AS-IS and TO-BE model in the Sales sector will be described and graphically presented.

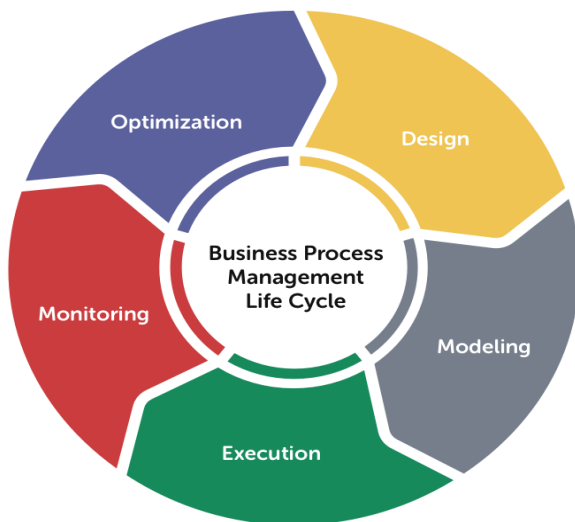
The conclusion states the facts that were revealed by writing the paper and the opinion of the Author. After the conclusion, all the literature used in writing the essay is listed, and Author cited a list of tables, graphs, and figures in the paper.

## 2. ROLE OF BUSINESS PROCESS MANAGEMENT

### 2.1. *Definition and basic concepts of Business Process Management*

Business processes in any organization describe the way management is in an organization. They can be referred to as the "guiding thread" in a business. Some processes are more critical in a particular organization, and those are less important but also indispensable. Business process management relies on a business approach to change direction to improve business processes. The ultimate goal is to achieve business goals, where change encompasses the entire life cycle of the process: from defining and modeling to performing, analyzing, and optimizing operations.<sup>1</sup> Each of these processes is key to success. Below is the Business Process Management Life Cycle.

Figure 1: Business Process Management Lifecycle



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<sup>1</sup> Dallavalle de Padua, Silvia Ines. "(PDF) an Analysis of BPM Lifecycles: From a Literature Review to a Framework Proposal | Business Process Management Journal." ResearchGate, Aug. 2013  
[www.researchgate.net/publication/262574947\\_An\\_analysis\\_of\\_BPM\\_lifecycles\\_From\\_a\\_literature\\_review\\_to\\_a\\_framework\\_proposal](http://www.researchgate.net/publication/262574947_An_analysis_of_BPM_lifecycles_From_a_literature_review_to_a_framework_proposal). (09 August 2021)

In addition to the crucial role of the life cycle of process management, it is essential to list the key elements without which Business people could not realize the business process. These are:

- customers
- set of activities
- input (resources) and output (products and services)
- people
- technology

Business processes can be viewed from two different sides; they have two completely different understandings. In a broader sense, they can represent solving a job in an organization where their primary role is to produce a specific output. In a narrower sense, a business process can be explained as a structured, analytical, cross-functional set of activities that requires constant improvement. It is essential how specific processes will be performed for the overall success of the organization. To better understand the concept of process, it will be compared with the concept of the project. Although they look similar, they are actually distinguished by the time dimension of doing the job and divided tasks. The project is undoubtedly short-lived. It has its deadline by which it must be completed, while, say, the process is constant, it is done continuously. This makes the main difference between a project and a process.<sup>2</sup>

## ***2.2. Benefits and limitations of Business Process Management***

As mentioned above, managing business processes is key to the success of a firm or organization. You need to be able to determine who will manage which functions and deploy

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<sup>2</sup> P. Sikavica, T. Hernaus: „Dizajniranje organizacije“, Zagreb, 2011., str. 320

them exactly. Below will list the advantages of Business process management, and each of them will be described in detail. Those are:<sup>3</sup>

- Improved business agility

Nowadays, due to the advancement of technology, changes are happening in every company, and the company must know how to deal with them. Business Process Management gives companies a better ability and speed of adopting new changes, which is very important for the success of a particular company.

- Increased Efficiency

Business processes must work well and are effective. Business process management certainly helps employees but also managers to better understand every step of the business process. BPM helps determine how the process works under optimal conditions and allows users to change the process but keeping that goal in mind. In addition, it can automate manual tasks to increase productivity and reduce the possibility of human error.<sup>4</sup>

- Increased Effectiveness

With BPM, specific tasks are certainly solved much faster with as few errors as possible. BPM platforms, because of the ability to share knowledge, help improve decision-making. Therefore, they help the entire organization increase workforce productivity, constantly enhance product quality, and reduce corporate risk.

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<sup>3</sup> Rudden, Jim. Making the Case for BPM Making the Case for BPM: A Benefits Checklist. , 2007. Available at: [http://faratarjome.ir/u/media/shopping\\_files/store-EN-1458290674-6112.pdf](http://faratarjome.ir/u/media/shopping_files/store-EN-1458290674-6112.pdf) (9 August 2021)

<sup>4</sup> Kerstetter, Kerie. “Six Benefits of Business Process Management | Blueprint.” Diligent Insights, 10 Apr. 2018, <https://insights.diligent.com/business-structures/six-benefits-of-business-process-management/> (9 August 2021)

Some of them are employee satisfaction. It has been proven that BPM reduces much bureaucracy and thus allows employees to focus entirely on their work because process automation reduces repetitive work and makes information access easier. It is essential to mention the advantage of improving Customer Focus. As we mentioned, productivity is increased, and employees can focus better on the customer. With BPM, specific proposals will be reacted to faster, and the solutions needed to achieve the goal and adapt to a specific situation will be made more quickly. Other benefits are Consistency, Repeatability & Transferability. Every task in a particular organization is performed in the way it was designed. The same thing happens with the problems that arise; there is no need to create a new way of solving the problem. A significant advantage is a Measurability, where absolutely all processes are measured and compared with the expected results.

These are some of the benefits that Business Process Management brings us in an organization. In addition to the many advantages, some disadvantages can occur.

It is essential to know how to handle BPM as otherwise, it can do more harm than good. BPM is undoubtedly affordable but not cheap. But with proper use, the money invested will return quickly. Therefore, organizations should not be afraid of this if they adhere to the guidelines for use.

In addition to the initial cost, limited innovation is also mentioned. BPM should take full advantage of modern technology, but most companies adopting BPM fail to adopt modern technology and workforce. This concludes that BPM hinders the development of innovation.

Even with the shortcomings listed, BPM does the job successfully because most organizations need this kind of work methodology to be successful and efficient. It is especially needed by industries like ICT, accounting, engineering, and more.

### 2.3. *Types of Business Process Management KPIs*

Key Performance Indicators (KPIs) figure out how to measure and continually improve business processes in an organization.<sup>5</sup> They mainly help determine a company's strategic, financial, and operational goals, especially those of other businesses within the same sector.

Due to excessive competition in the world and the constant development of technology, organizations must adapt to the market and take care of constant progress, which is key to the success of the organization. In this way, customer satisfaction is created, but also employee satisfaction, and they are important for the survival of a particular company.<sup>6</sup>

Business processes manage the work of an organization, and it is essential how and in what way they function. Key Performance Indicators allow a particular firm to determine its market position relative to other competitors.

In addition, it allows you to identify weak points or identify problems that can disrupt the success of a particular firm and bring about failure.

It helps to determine and measure the extent to which specific goals have been achieved, which is very important for further growth.<sup>7</sup>

KPIs can be divided into two groups, which are long-term and short-term KPIs.

As the word itself says, long-term KPIs are used for a longer time frame, say a year or six months back. It is usually based on business intelligence (BI) technology, referring to increasing sales or improving customer retention and the like. In addition, looking from the perspective of

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<sup>5</sup> Paz Cuturi, Maria. "Key Performance Indicators for BPM - BPM Leader." BPM Leader, 24 Aug. 2015, [www.bpmlider.com/2015/08/24/key-performance-indicators-bpm/](http://www.bpmlider.com/2015/08/24/key-performance-indicators-bpm/). (10 Aug. 2021)

<sup>6</sup> Doc.dr.sc. Milanović Glavan, Ljubica, and prof.dr.sc.Ivan Strugar. KLJUČNI POKAZATELJI USPJEŠNOSTI ZA PROCESNO ORIJENTIRANA PODUZEĆA: SMJERNICE ZA IDENTIFIKACIJU POKAZATELJA. , 30 Sept. 2019. (10 August 2021)

<sup>7</sup> BPM KPI | How to Use KPIs to Measure Business Process Management Goals." Kissflow, 25 Mar. 2021. Available at: <https://kissflow.com/workflow/bpm/business-process-management-kpi/>. (10 August 2021)

business process management, the user will generate their reports, view and modify information, cut out data if necessary, export them, and analyze as needed.

While say short-term KPIs provide short-term analysis that goes back one minute, hour, or the day before. They are referred to as "real-time indicators." We collect data using these indicators are typically obtained on Business Activity Monitoring (BAM) and are shown on a Balanced Scorecard (BSC).<sup>8</sup> These tools allow a particular company to react in time so that some deadlines are not exceeded. Short-term KPIs certainly serve to measure the goals that govern business processes. As an example of this, it can be a process in which each step is studied, and it is measured how long individual steps within a process last and what kind of blockages can occur, thus slowing down the process itself. The main goal of a short-term KPI is to increase overall productivity and efficiency within a particular process or particular business activity.

Although the use of KPIs significantly helps to achieve goals in an organization, one should know how to serve with it. It serves to measure the progress of both employees and the overall organization. They also provide an excellent way of meaningful measurement data in areas that can be improved in business processes. In addition, it provides the objective data needed to identify possible mistakes and to be able to change for the better for a more successful business.<sup>9</sup>

#### **2.4. BPMN Meta-Model**

The Standard Business Process Model and Notation (BPMN) was developed by the Object Management Group (OMG), and the primary goal is to provide a record that all business users can understand. Business users such as business analysts to technical programmers who perform these processes and business people who manage and monitor the same processes.

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<sup>8</sup> Parmenter, David. Key Performance Indicators: Developing, Implementing, and Using Winning KPIs. Google Books, John Wiley & Sons, 13 Apr. 2015, pp. 122–123. Available at: [https://books.google.hr/books?hl=hr&lr=&id=bKkxBwAAQBAJ&oi=fnd&pg=PA101&dq=key+performance+indicators+developing+implementing+and+using+winning+kpis&ots=cZV3j4g3bs&sig=kgFVN4Q6O72dQiYn0-jV2JbIsA&redir\\_esc=y#v=onepage&q=key%20performance%20indicators%20developing%20implementing%20and%20using%20winning%20kpis&f=true](https://books.google.hr/books?hl=hr&lr=&id=bKkxBwAAQBAJ&oi=fnd&pg=PA101&dq=key+performance+indicators+developing+implementing+and+using+winning+kpis&ots=cZV3j4g3bs&sig=kgFVN4Q6O72dQiYn0-jV2JbIsA&redir_esc=y#v=onepage&q=key%20performance%20indicators%20developing%20implementing%20and%20using%20winning%20kpis&f=true) .(10 Aug. 2021)

<sup>9</sup> “BPM KPI | How to Use KPIs to Measure Business Process Management Goals.” Kissflow, 25 Mar. 2021. Available at: <https://kissflow.com/workflow/bpm/business-process-management-kpi/> . (11 August 2021)



In fact, BPMN creates a standardized bridge for the gap between business process design and implementation process.<sup>10</sup>

To achieve specific goals in an organization, it is essential to manage the organization to increase its efficiency successfully. In every organization, there are business processes that are interconnected and have a common goal. It is essential to know the whole organization and how it operates to perform the tasks successfully.<sup>11</sup>

BPMN 2.0 is an evolution in using symbols that serve to determine flows and business processes within a Business process diagram. BPMN 2.0 was created to create a common standard language for business process modeling. Universal symbols understood by professionals within the field are used to create process diagrams.

BPMN depicts these four element types for business process diagrams:<sup>12</sup>

- Flow objects: events, activities, gateways
- Connecting objects: sequence flow, message flow, association
- Swimlanes: pool or lane
- Artifacts: data object, group, annotation

BPMN is divided by types of events. The event is represented by a circle and describes what happened in the process. It affects the course of the process and has a trigger and a result. The initial event is listed first, then there can be an Intermediate event (representing any event that occurs between the initial and final event), and finally, there is an end event that signals the final step in the whole process.

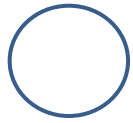
And the appearance of the events in the modeling program is shown below:

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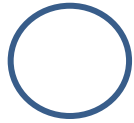
<sup>10</sup> OMG. Business Process Model and Notation (BPMN). , 2011. Available at: <https://www.omg.org/spec/BPMN/2.0/PDF>. (11 August 2021)

<sup>11</sup> Brumec, Josip. KORIS K O R IS Onzaltng Rganizacija Azvoj Modeliranje Poslovnih Procesa Prvi Dio: Uvod U Modeliranje., Sept. 2011. Available at: <file:///C:/Users/USER/Desktop/koris-uvod-u-modeliranje-poslovnih-procesa.pdf>. (16 August 2021)

<sup>12</sup> “What Is Business Process Modeling Notation.” Lucidchart. Available at: [www.lucidchart.com/pages/bpmn](http://www.lucidchart.com/pages/bpmn). (16 August 2021)



**Start Event**



**Intermediate Event**

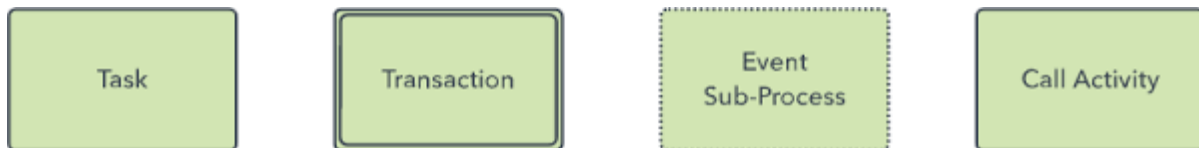


**End Event**

To perform a business process, it is essential to specify BPMN activity symbols. Activities indicate work within the system. It can be atomic or compound. Four types of symbols describe the operation of activity within a business process. We call them Task symbol, Sub-process symbol, Transaction symbol, and Call symbol.

They are shown below:

**Figure 2: BPMN activity symbols**



Source: “What Is Business Process Modeling Notation.” Lucidchart. <https://www.lucidchart.com/pages/bpmn>. (17August 2021)

- Task activity indicates the most basic level of activity and cannot be divided
- A transaction symbol is a specific sub-process that involves exclusive payment
- A sub-process symbol indicates a group of work steps that agree together. It has two different views of the subprocess. One is a concise view marked with a plus sign and is used to display more details. While the second is an extended view of the subprocess that is large enough to accommodate all the work steps describing the subprocess
- The last symbol is the Call symbol is also called a global subprocess that is reused at various points in the business flow.

In addition to the event and activities, it is essential to mention the gateways. They flow objects without which the users could not model the business process. They are used to manage activity flows. The gateway is marked with a rhombus and displays branching, forking, merging, and joining flows. The gateway is marked with a rhombus and showed branching, forking, merging, and joining flows.

The following will describe each in detail and show its shape and appearance:<sup>13</sup>



**Exclusive gateway** only one choice of several possible paths is selected. Examples are: a trainee in an office will write a contract if the lawyer gives him approval; the agreement will not be written without approval.



**Event-based gateway** is similar to the previous gateway because both switches include one lane in progress. In the case of a turnout conditioned by an event, one should be able to assess which event occurred and not which condition was met. E.g. you need to sign some paper, but you are unsure if you can do it and are waiting for the director to return to the office. If the director has not returned, that paper will not be signed.



**Parallel gateway** is different from other gateways. The parallel gateway does not depend on conditions or events. It is used to represent two simultaneous work steps in a business flow.

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<sup>13</sup> “What Is Business Process Modeling Notation.” Lucidchart. Available at: [www.lucidchart.com/pages/bpm](http://www.lucidchart.com/pages/bpm). (17 August 2021)



**Parallel event-based gateway** is similar to a parallel gateway. It allows multiple processes to occur simultaneously, but unlike parallel gateway processes it depends on specific events.



**An Inclusive gateway** divides the process flow into one or more streams, which would mean that all alternative routes can be considered. There is only one input stream in the gateway, and there are two or more output streams. Connection with an inclusive gateway is optional.<sup>14</sup>



**Complex gateway** explains that they are used in the most complex business process processes. The conditions for each input event are examined, and it is ideal for use when multiple switches are needed to describe the business flow.

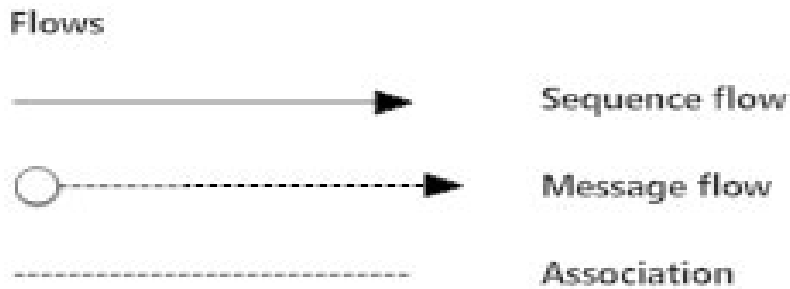
Connecting objects in a BPMN diagram are also important throughout the process. These are lines that connect BPMN flow objects. There are three different types: sequence flow, message flow, and associations.<sup>15</sup>

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<sup>14</sup> UPRAVLJANJE POSLOVNIM PROCESIMA - VJEŽBE. , 2017. Available at: <http://www.efos.unios.hr/upravljanje-poslovnim-procesima/wp-content/uploads/sites/196/2018/09/Vje%C5%BEba-4.pdf> (17 August 2021)

<sup>15</sup> Burrows, Prof. William. Visual Paradigm Introduction to BPMN Part III -Flow and Connecting Objects Introduction to BPMN Part III -Flow and Connecting Objects. , Mar. 2016. Available at: <https://www.visual-paradigm.com/tutorials/bpmn3.jsp>. (17 August 2021)

Figure 3: Connecting objects



Source: “Business Process Mapping and Modeling - Tips, Examples, Tutorials, More.” *Smartdraw.com*, 2019. Available at: [www.smartdraw.com/business-process-mapping/](http://www.smartdraw.com/business-process-mapping/). (17 August 2021)

Sequence flow connects flow objects in proper sequential order; Message flow represents messages from one process participant to another, and Association flow shows the relationship between artifacts and flows objects.

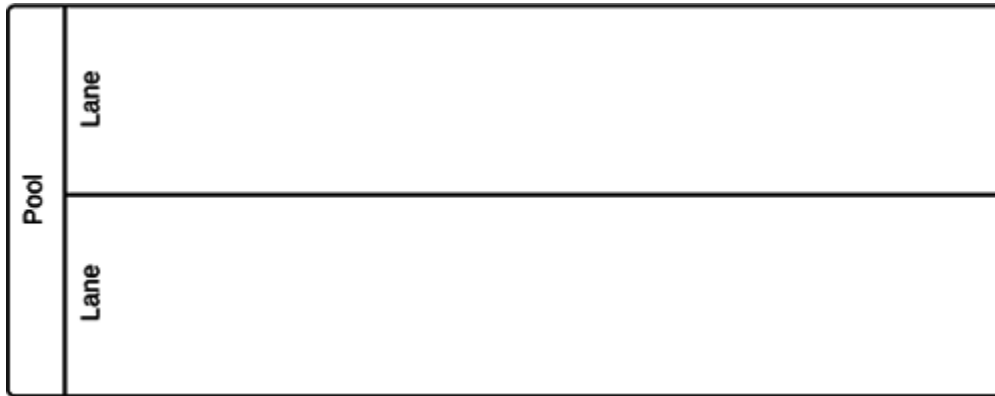
What is still needed to create the BPMN model is Swimlanes. They are used to organize aspects of a process in a BPMN diagram. Swimlanes visually group objects into lines, with each element of the process added to a separate line. These elements can be arranged either horizontally or vertically. They indeed organize activities into different categories. In addition, they can detect delays, inefficiencies, and workers who are responsible for each step in the process.<sup>16</sup>

In Figure 4 you can see what Swimlanes looks like in a modeling program.

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<sup>16</sup> “Modeling Business Processes with Swimlanes.” *Learning BPMN*, 2018. Available at: <https://bpmn.gitbook.io/learning-bpmn/what-is-bpmn-part-1-of-3/modeling-business-processes-with-swimlanes>. (17 Aug 2021)

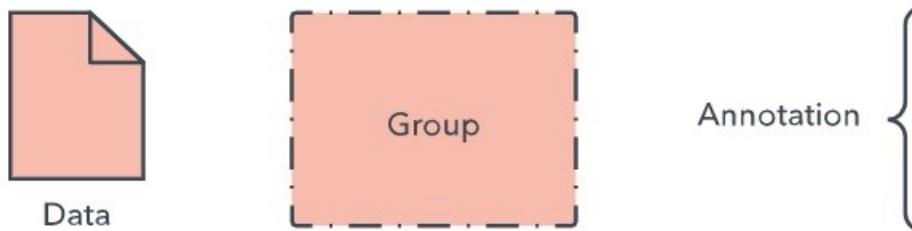
Figure 4: Swimlanes



Source: “BPMN Diagram Symbols & Notation.” *Lucidchart*, 2019, [www.lucidchart.com/pages/bpmn-symbols-explained](http://www.lucidchart.com/pages/bpmn-symbols-explained). (17 August 2021)

And the last no less important item essential for creating the model is the Artifacts in BPMN. They represent information that is very important for the overall model but not for the individual elements within the process. We divide them into annotations, groups, and data objects, and they are used in the BPMN 2.0 diagram.

Figure 5: Data, Group and Annotation



Source: “What Is Business Process Modeling Notation (BPMN) | EdrawMax Online.” *Www.edrawmax.com*, [www.edrawmax.com/bpmn/](http://www.edrawmax.com/bpmn/). (17 Aug 2021)

Groups are used to group certain activities that are relevant to the whole process.

Annotations are used to provide additional information to the model expert, some notes, descriptions of activities, and the like.

Data objects show the use, creation, or modification of documents or data. They can display both electronic and physical records. The types are shown below:<sup>17</sup>



**Data input symbol** - Represents data requirements that tasks in the business process depend on.



**Data output symbol** - Demonstrates information produced as the result of a business process.



**Data collection symbol** - Signifies information collected within a business process.



**Data storage symbol** - Represents the ability to store or access data that's associated with a business process.

## **2.5. *BPMN Meta-model with KPI extension***

As already stated in Chapter 2.3, key performance indicators (KPIs) are significant for measuring and improving business processes in an organization. A model with KPI extension is, as the word itself says, a model with an extension, actually an extended model. In a model consisting of extended modeling elements, records are added, and their meaning is changed, but consistency is still displayed. Let's say one example of an extended element is the use of an initial event.

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<sup>17</sup> "BPMN Diagram Symbols & Notation." *Lucidchart*, 2019. Available at: [www.lucidchart.com/pages/bpmn-symbols-explained](http://www.lucidchart.com/pages/bpmn-symbols-explained). (17 August 2021)

A message element is added, and the meaning changes from a simple "start" to a "message-triggered start." These extended modeling elements aim to allow users to determine how an event begins; not just started; details are actually added to the process itself.<sup>18</sup>

Figure 6 shows the simple start event and message-triggered start event.

**Figure 6: Start Event and Start Event (message-triggered)**



Source: Eby, Kate. "Business Process Modeling and Notation (BPMN) 101 | Smartsheet." *Smartsheet*, 2019. Available at: [www.smartsheet.com/beginners-guide-business-process-modeling-and-notation-bpmn](http://www.smartsheet.com/beginners-guide-business-process-modeling-and-notation-bpmn). (19 August 2021)

As mentioned above in Chapter 2.4, there are three types of events, namely the beginning, intermediate, and end. They can be assigned to catching events, throwing events, and interrupting or non-interrupting events. The trigger defines the catching of the event, and after activating the trigger, that event begins. This would mean that the event itself triggers the process they do not respond to triggers. At the moment of the event that is interrupted, the action is then blocked. And when an event is started that does not stop; the action continues in that situation. Figure 7 is shown below, which explains the extended events.<sup>19</sup>

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<sup>18</sup> Eby, Kate. "Business Process Modeling and Notation (BPMN) 101 | Smartsheet." *Smartsheet*, 2019. Available at: [www.smartsheet.com/beginners-guide-business-process-modeling-and-notation-bpmn](http://www.smartsheet.com/beginners-guide-business-process-modeling-and-notation-bpmn). (19 August 2021)

<sup>19</sup> "BPMN Modeling Reference - All BPMN 2.0 Symbols Explained | Camunda BPM." *Camunda BPM*, 2019. Available at: <https://camunda.com/bpmn/reference/>. (19 August 2021)



Figure 7: Extended events

	"Catching"		"Throwing"		Non-Interrupting	
Message						
Timer						
Error						
Escalation						
Cancel						
Compensation						
Conditional						
Link						
Signal						
Terminate						
Multiple						
Parallel Multiple						

Source: Eby, Kate. "Business Process Modeling and Notation (BPMN) 101 | Smartsheet." *Smartsheet*, 2019. Available at: [www.smartsheet.com/beginners-guide-business-process-modeling-and-notation-bpmn](http://www.smartsheet.com/beginners-guide-business-process-modeling-and-notation-bpmn). (19 August 2021)

There are also extended event subprocesses, as shown in Figure 8.

Figure 8: Extended Event Subprocesses



Source: Eby, Kate. "Business Process Modeling and Notation (BPMN) 101 | Smartsheet." *Smartsheet*, 2019. Available at: [www.smartsheet.com/beginners-guide-business-process-modeling-and-notation-bpmn](http://www.smartsheet.com/beginners-guide-business-process-modeling-and-notation-bpmn). (19 August 2021)

Figure 8 shows: Activity Tasks, Sub-processes, Transactions and Call Activities Extended. Certain tasks with an additional record can also be added to show more significant specifics. The following are shown and described:

- Receive – waits for a message from an external participant
- Script - indicates the task performed by the machine
- Manual - indicates a task that works without the help of an engine or application
- Receive (Instantiated) - this is a task that is designed to wait for a message to arrive from an external participant and then initiate the process
- Service - a task that uses a web service or an automated application
- User - is a human task that is planned through the manager
- Send - is a task created to send a message to an external participant
- Business rule - is a task that confirms the entry before execution using a business rules machine

BPMN specifies also three types of markers for a task. And those are a loop, a multiple instance and compensation. A task may have one or two of these markers.<sup>20</sup> They are shown in Figure 9.

**Figure 9: Loop, Multiple instances and Compensation**



Source: “Activities.” *Kb.qpr.com*, 2014. Available at: <https://kb.qpr.com/qpr2014-1/activities.htm>. (19 Aug 2021)

- The loop - continues as long as the condition is true and a numerical limit can be specified.
- Multiple instances - can be run in parallel or sequentially. A data-based expression or setting can be used to determine the number of instances.

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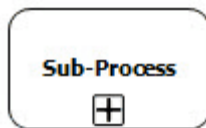
<sup>20</sup> “Activities.” *Kb.qpr.com*, 2014. Available at: <https://kb.qpr.com/qpr2014-1/activities.htm>. (19 August 2021)

- Compensation tasks - determine some type of compensation or payment, whether done in the process or out of it.<sup>21</sup>

Subprocesses show lower levels or more detailed levels in a process event task. It can be in a narrowed view that hides its details. In a concise form, there is a "plus" sign indicating that the activity is a subprocess and has a lower level of detail.<sup>22</sup>

The following is a collapsed subprocess:

**Figure 10 - Collapsed Sub-Process**



Source: “Remove the Ability to Model Collapsed Sub-Processes · Issue #1486 · Camunda/Camunda-Modeler.” *GitHub*, 2019. Available at: <https://github.com/camunda/camunda-modeler/issues/1486> (19 Aug 2021)

In addition, four types of markers can be combined with a subprocess label. These include loop, multiple instances, ad-hoc, and compensation, which shows below in Figure 10.<sup>23</sup>

**Figure 11- Loop, Multiple instances, Ad-hoc and Compensation**



Source: [https://theforest.net/user/dan\\_fisher](https://theforest.net/user/dan_fisher) . “OMG | Object Management Group.” *Omg.org*, 2019, [www.omg.org/](http://www.omg.org/). (19 August 2021)

<sup>21</sup> Eby, Kate. “Business Process Modeling and Notation (BPMN) 101 | Smartsheet.” *Smartsheet*, 2019. Available at: [www.smartsheet.com/beginners-guide-business-process-modeling-and-notation-bpmn](http://www.smartsheet.com/beginners-guide-business-process-modeling-and-notation-bpmn). (19 August 2021)

<sup>22</sup> “Activities.” *Kb.qpr.com*, 2014. Available at: <https://kb.qpr.com/qpr2014-1/activities.htm> . (19 August 2021)

<sup>23</sup> “OMG | Object Management Group.” *Omg.org*, 2019, [www.omg.org/](http://www.omg.org/). (19 August 2021)

The addition of extra notation to connecting objects can extend their usage in BPMN. These include conditional flows, Default flows, exception flows, and compensation associations. They are explained below and shown in Figures and 12 and 13.<sup>24</sup>

- Conditional flows are used in merging and branching in place of a gateway. A conditional expression is defined at its origin
- Default flows are only selected if no other sequence flows available. Conditions on a default sequence flow are always ignored. There may be only one default flow per object
- Exception flows occur outside of the normal flow of the process and are based on an intermediate event on the boundary
- Compensation associations are used when an activity is canceled, and the process must be set to its original state

Figure 12 - Conditional flows and Default flows



Source: *Business Process Model and Notation (BPMN)*, 2011. Available at: <https://www.omg.org/spec/BPMN/2.0/PDF>. (19 August 2021)

Figure 13 - Exception flows and Compensation flows



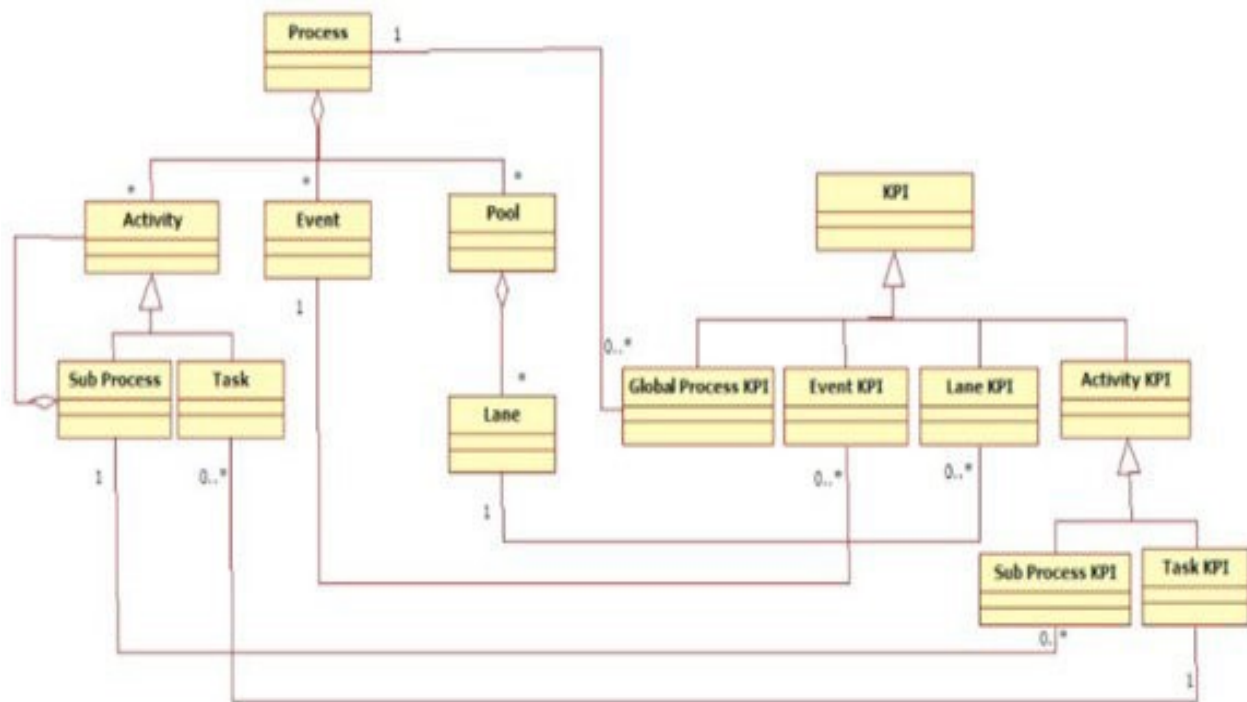
Source: *Business Process Model and Notation (BPMN)*, 2011. Available at: <https://www.omg.org/spec/BPMN/2.0/PDF>. (19 August 2021)

<sup>24</sup> *Business Process Model and Notation (BPMN)*, 2011. Available at: <https://www.omg.org/spec/BPMN/2.0/PDF>. (19 August 2021)

An example of the Meta-model BPMN design with KPI extension will be shown below. The goal of BPM is certainly the continuous improvement of business processes. In Figure 14, meta-model concepts have been added that include KPIs, which are:<sup>25</sup>

- Global process KPI - which measures the overall performance of a business process
- Event KPI - which measures event performance
- Lane KPI - measures lane performance
- Activity KPI - measures activity performance
- Subprocess KPI - measures subprocess performance
- Task KPI - measures task performance

Figure 14 - Meta model with KPI extension



Source: Wannes, Aicha, and Sonia Ghannouchi. "ScienceDirect ScienceDirect KPI-Based Approach for Business Process Improvement-NC-ND License. *Procedia Computer Science*, vol. 164, 2019, pp. 265–270. (19 Aug 2021)

<sup>25</sup> Wannes, Aicha, and Sonia Ghannouchi. "ScienceDirect ScienceDirect KPI-Based Approach for Business Process Improvement-NC-ND License. *Procedia Computer Science*, vol. 164, 2019, pp. 265–270. (19 Aug 2021)

### 3. THE IMPORTANCE OF DIGITALIZATION IN BUSINESS PROCESS

#### 3.1. *Digitalization*

Since in the last two decades, almost all media have switched to the distribution and storage of all data in digital form, and today everything is searched in digital format, so we call our period the digital age. Today, without digitization and the use of digital devices, the World could hardly function. From digital technologies to digitalization, all the way to digital transformation, that is how people, companies, various organizations, and companies operate today. There are two dimensions to digitization.<sup>26</sup> The first is stated in a broader sense, which is the translation of an analog signal into digital form. This would mean that all information that is in analog form is converted to numeric (digital form). While the second dimension is in a narrower sense, and that means:

- Image digitization
- Digitization of text
- Digitization of sound
- Digitization of moving images
- Three-dimensional digitization (3D digitization)

Digitalization is used for processing, storing, and transmitting data because it allows all types of information to be executed in almost all forms with the same efficiency and mixed. The very concept of digitalization implied the use of digital technology due to changes in business models and increased revenue to enable the creation of new values in an organization. It is a process that leads to digital business. This continues to be explained in Chapter 3.2.<sup>27</sup>

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<sup>26</sup> www.enciklopedija.hr. (n.d.). *digitalizacija* | *Hrvatska enciklopedija*. [online] Available at: <https://www.enciklopedija.hr/natuknica.aspx?id=68025>. (25 Aug 2021)

<sup>27</sup> Golubić, S. (n.d.). Digitization is one of the fundamental components of the open information society development model. *InfoTrend*. Available at: <http://www.infotrend.hr/clanak/2016/7/digitalizacija-jedna-od-temeljnih-sastavnica-modela-razvoja-otvorenog-informacijskog-drustva,88,1251.html>. (25 Aug 2021)

### 3.2. *Digital Transformation*

Digital transformation actually has the task of using digital technologies to create some new or perhaps modify some already existing technologies.<sup>28</sup>

The digital transformation uses digital technologies to create some new or perhaps modify some already existing technologies. It refers to the process that begins when a particular company begins to introduce digital technologies in all business areas and lasts until the moment of their full integration. In addition to the fact that a specific organization introduces digital technology into its business, it is not enough to experience digital transformation. It is very important to educate employees so that the digital transformation is fully completed.<sup>29</sup>

To achieve a successful digital business transformation, it is essential to meet the following seven criteria:<sup>30</sup>

- Communication, change management, and consistency (it is essential to communicate openly with the business team, inform them about the changes and assign a role to everyone)
- Objective assessment of the current situation (it is essential to clearly define the state of the company and have an insight into all its shortcomings to come up with the right solutions that would bring the best result)
- Management support (digitalization of business must be a strategic priority at the level of the entire business organization and have the necessary budget)
- Use the feedback of the business team (the business team is the one that will use some new applications, software, etc. and they must be familiar with the changes that will bring digital transformation)

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<sup>28</sup> “What Is Digital Transformation? | a Definition by Salesforce - Salesforce.com.” *Salesforce.com*, 2018. Available at: [www.salesforce.com/products/platform/what-is-digital-transformation/](https://www.salesforce.com/products/platform/what-is-digital-transformation/). (22 August 2021)

<sup>29</sup> Blagojević, Nataša. “Što Je Zapravo Digitalna Transformacija I Kakve Nas Promjene Očekuju.” *Hrvatska - European Commission*, 25 July 2019. Available at: [https://ec.europa.eu/croatia/what\\_is\\_digital\\_transformation\\_changing\\_hr](https://ec.europa.eu/croatia/what_is_digital_transformation_changing_hr). (22 Aug 2021)

<sup>30</sup> editor. “Uspješna Digitalizacija Poslovanja U 7 Koraka.” *4APP SOLUTION D.o.o.*, 24 Aug. 2020, [www.4app.hr/blog/digitalizacija-poslovanja-7-kljucnih-koraka/](http://www.4app.hr/blog/digitalizacija-poslovanja-7-kljucnih-koraka/). (22 Aug 2021)

- Educate and explain the benefits of digitization
- Make a budget plan for the implementation of new solutions
- Define and present short-term and long-term results of digitalization (it is necessary to communicate with the whole team daily, clarify what the tasks and responsibilities are. This contributes to avoiding mistakes and delays in business digitalization)

Digital transformation brings companies various benefits such as:<sup>31</sup>

- Helps the firm to be more competitive
- Definitely makes employees more productive
- Allow providing a better customer experience
- Increase analytical capacity
- Creation of new business opportunities
- Extends the life of the company
- Decentralization of work continuous training

In addition to the positive aspects that help a successful digital transformation, there are also challenges that a company can face. Unfortunately, not all companies are ready for a high level of digital transformation. Their IT departments are not up to digital technology requirements and are slow or even difficult to change.

Other challenges faced by IT departments:<sup>32</sup>

The first challenge is that digitalization requires consistent and comprehensive application of advanced technology; day by day, something new is created.

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<sup>31</sup> Digital Adoption Team. "Digital Transformation Pros & Cons: Your Challenges & Solutions Laid Bare." *Digital Adoption*, Digital Adoption, 12 Mar. 2019. Available at: [www.digital-adoption.com/digital-transformation-pros-and-cons/](http://www.digital-adoption.com/digital-transformation-pros-and-cons/). (22 August 2021)

<sup>32</sup> Spremić, M., (2017) Digital business transformation. Zagreb: Ekonomski fakultet



The second challenge relates to the expectation that business has towards informatics because today's informatics harmonizes with business and contributes to the visions of innovative business models and thus create new business value.

And the third challenge or opportunity is that digitalization means that IT must begin to be used as a strategic function with much more significant oversight by top managers. That is, IT should be seen as the essential business function.

Many technologies help companies make the digital transformation as successful as possible. The most commonly used technologies are:<sup>33</sup>

- Cloud technology - which helps keep data in a safe place by making backups
- The Internet of Things - is a system that is interconnected with a large number of computers, mechanical and digital machines, objects and people who have the ability to share data over a network without the need to interact with people or computers.
- Robotics - can be defined as the technology that controls the design, construction, operation and application of robots. It definitely plays a big role in increasing operational efficiency and creating more time to accomplish larger tasks
- Artificial Intelligence - shows a simulation of human intelligence in devices that are programmed to think like humans and to mimic human activities
- Augmented reality<sup>34</sup> - this is a technology that shows elements that do not actually exist in the real world through an application through the screen of a device
- 3D printing - it is used to create a prototype in physical form

Having listed which digital technologies can significantly help in business, the steps in creating a strategic plan for the application of digital technology in business are also important. These are actually the stages in which the application of digital technology is developed by applying certain methods from the business plan.

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<sup>33</sup> Factory. *Digitalna Transformacija*. [www.mirakul.hr/wp-content/uploads/2020/10/Factory-digitalna-transformacija-HR.pdf](http://www.mirakul.hr/wp-content/uploads/2020/10/Factory-digitalna-transformacija-HR.pdf). ( 22 Aug 2021)

<sup>34</sup> Blagojević, Nataša. "Što Je AR, a Što vr I Kako Nam Tehnologija Pomaže Doživjeti Stvarnost." *Hrvatska - European Commission*, 18 Feb. 2019. Available at: [https://ec.europa.eu/croatia/content/what-is-AR-what-VR-and-how-technology-helps-us-to-experience-reality\\_hr](https://ec.europa.eu/croatia/content/what-is-AR-what-VR-and-how-technology-helps-us-to-experience-reality_hr). ( 22 Aug 2021)

These are:<sup>35</sup>

1. Global vision and business analysis
2. Industry analysis of the external business environment
3. Analysis of the internal business environment
4. Designing a digital business model
5. Analysis of the functioning of the existing information system
6. Visions and goals of the information system that support the digital business model
7. Information system guidelines
8. Operational implementation of the digital business transformation plan

### **3.3. *Business Process Management drives Digital Transformation***

Business Process Management deals with processes that are constantly changing in business. When an organization wants to introduce some innovations and adapt them to business processes, BPM provides an additional platform that can be used to view specific data, change something, or even improve it. While let's say digital transformation, as the word itself says, these are digital world changes. It certainly includes changes in thinking, changes in business, acceptance of new technology, digitalization of company resources, and acceptance of innovation. From these facts, it can be concluded that BPM and digital transformation complement each other.<sup>36</sup>

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<sup>35</sup> Spremić, M., (2017) Digital business transformation. Zagreb: Ekonomski fakultet, p. 102

<sup>36</sup> Platform, Comidor BPM. "How BPM Drives Digital Transformation | Comidor Low-Code BPM." *Comidor BPM Platform*, 17 Oct. 2017. Available at: [www.comidor.com/blog/business-process-management/bpm-drives-digital-transformation/](http://www.comidor.com/blog/business-process-management/bpm-drives-digital-transformation/). (23 Aug 2021)

The role of BPM, or business process management software, is crucial in developing digital transformation. Some research shows that using BPM software is more critical and risky than any other software. But any other software can work to improve performance and facilitate management standards without changing a department's structure or workflow. At the same time, the application of BPM software requires radical changes and reconsideration of the mode of operation. And it is precisely this radical change that is the key to why BPM software is so associated with digital transformation.<sup>37</sup>

Although most companies have decided to use BPM, after a while, they achieve a high level of efficiency and learn how to use it properly to improve performance, but day by day, there are new challenges as technology advances. For this reason, various analysts suggest that changes should be constantly monitored, and the practice of BPM itself should be treated as a continuous initiative.

When the digital transformation initiative is mentioned in this case, the BPM system has three main tasks, which are:<sup>38</sup>

- The growing complexity of business operations that forces organizations to review, change, and improve their processes constantly needs to be addressed.
- The growing need for extensive cooperation, flexibility, and mobility needs to be addressed to make business processes as good as possible, reduce complexity, and increase collaboration.
- The need to increase the efficiency of process interaction needs to be addressed to improve relationships with customers, partners, associates, and customers, thus ensuring effective communication, information exchange, and collaboration.

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<sup>37</sup> “Business Process Management Enables Digital Transformation in 2020.” *Kissflow*, 5 Apr. 2021. Available at: <https://kissflow.com/workflow/bpm/how-bpm-is-taking-a-central-role-in-digital-transformation/> (23 August 2021)

<sup>38</sup> García, Jorge. “Using BPM to Accelerate Digital Transformation.” *Process Excellence Network*, 23 Oct. 2018, [www.processexcellencenetwork.com/business-transformation/articles/using-bpm-to-accelerate-digital-transformation](http://www.processexcellencenetwork.com/business-transformation/articles/using-bpm-to-accelerate-digital-transformation). (23 August 2021)

In addition, BPM should be used for direct support and certainly to simplify the entire process, automate individual tasks that could be performed without interaction with clients, and reduce the time spent that users need to complete a particular process successfully.

Changes sometimes do not have to bring only positive results, but unfortunately also negative ones. For this reason, many companies are afraid to make changes in business processes. Digital transformation in business process management means constantly introducing new changes, accepting experimentation, and moving away from established business processes. With the help of digital transformation (DT), processes become much faster because redundant steps in the process are skipped or discarded. In addition, it is essential to mention the introduction of artificial intelligence, cloud, or robot. What makes the whole process much more interesting for employees, unnecessary tasks are removed, and some new exciting processes are introduced that are much more dynamic.

The key goals of every organization, which are also the goals of Digital Transformation (DT), are actually:<sup>39</sup>

- Customer Experience
- Operational Agility
- Digital technology integration

Using social platforms, cloud or IoT can help a lot in the business of a company. Due to the growing competition, it is essential to constantly adopt new technologies that could help us identify new business opportunities. Business process management operates between some processes or applications or even people, while say Digital Transformation can be used to transform business tasks, services, or even models that would certainly help the company in the very progress of the business.

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<sup>39</sup> Krmpotić, Goran. "Digitalna Transformacija (DT) I Upravljanje Poslovnim Procesima (BPM)." *Goran Krmpotić*, 2021. Available at: <https://gorankrmpotic.eu/upravljanje-poslovnim-procesima/digitalna-transformacija-upravljanje-poslovnim-procesima/>. (23 Aug 2021)

In addition to helping us in BPM introduce the latest technological trends, DT also helps us with cultural change. It also allows employees, management staff, external associates, customers.

All companies that want a more successful business to achieve better speed and agility must dedicate themselves to digital transformation to make the most of today's technology for progress. BPM software is a vital part of the digital transformation. Each organization acts independently and must review its digital transformation strategies and assess how much of its BPM platforms are part of that strategy.<sup>40</sup>

### **3.4. *Impact of the Digitalization in the company***

Nowadays, companies face challenges related to digitalization daily, in fact, just advancing technology. Digitalization has a significant impact on society and business. Although the transition to digital technology and its improvement brings many positive things, unfortunately, it also brings negative ones, such as investing in it and the costs associated with digitalization.<sup>41</sup>

Indeed, digitalization contributes a lot today; it has contributed significantly to many industries. The following are many leaders in global digital platforms such as:<sup>42</sup>

- Digital booking platforms, such as Airbnb and Booking.com,
- Digital industrial platforms (General Electric),
- Digital transport platforms: Uber, Blablacar, Bolt and Lyft,
- Digital trading platforms: eBay, Alibaba and Amazon,
- Digital communication platforms: Facebook, Instagram, Snapchat, LinkedIn and Twitter,
- Digital marketing platforms: Facebook, Google and Instagram,

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<sup>40</sup> Cutura, Sascha. "How BPM Can Impact Your Digital Transformation." *Info.convedo.com*, 2021. Available at: <https://info.convedo.com/how-bpm-can-impact-your-digital-transformation>. (23 Aug 2021)

<sup>41</sup> Cohen, Yuval. "(PDF) Digitalization: A Literature Review and Research Agenda." *ResearchGate*, 2020. Available at: [www.researchgate.net/publication/340067801\\_Digitalization\\_A\\_Literature\\_Review\\_and\\_Research\\_Agenda](http://www.researchgate.net/publication/340067801_Digitalization_A_Literature_Review_and_Research_Agenda). (20 August 2021)

<sup>42</sup> Spremić, M., (2017) Digital business transformation. Zagreb: Ekonomski fakultet, pp. 38-39

- Digital education platforms: Coursera, edX, Udacity,
- Digital payment platforms: Paypal, Google Wallet, Apple pay,
- Digital production platforms: Adidas Speedfactory, Adidas 3D Future Craft

It would be challenging for these companies to have such success without the following digitalization, introducing programs, applications, and various benefits that digitalization has contributed to them.

Digitalization is undoubtedly a process to which a particular company needs to adapt, and it needs to be ready for change and the consequences that can occur. In principle, it serves to improve the business itself, for example, the transformation of business processes, accelerating them and greater efficiency.<sup>43</sup>

Its purpose is to enable automation, constant improvement of the quality of data collection, and structuring this data with better software. Today's problems are that most companies have many documents, their maintenance, storage, and various complex processes that take much time. Digitization helps with multiple programs that compose papers themselves and keep them safe in electronic form. Companies that do not adapt to digitalization will disappear from the market quickly because they will not be able to compete with companies that apply a high level of digitalization. Information technology helps companies a lot in terms of organization, visibility of specific data, and the speed of access to certain data, which ultimately benefits the overall successful operation of a company.<sup>44</sup>

Therefore, to survive in the market and compete with other companies, it is essential to invest in the digitalization of business.

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<sup>43</sup> Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, 28(2), pp.118–144.

<sup>44</sup> Ismail, Mariam Helmy, et al. "(PDF) Digital Business Transformation and Strategy: What Do We Know so Far?" *ResearchGate*, 2018. Available at: [www.researchgate.net/publication/322340970\\_Digital\\_Business\\_Transformation\\_and\\_Strategy\\_What\\_Do\\_We\\_Know\\_So\\_Far](https://www.researchgate.net/publication/322340970_Digital_Business_Transformation_and_Strategy_What_Do_We_Know_So_Far). (22 August 2021)

Digitalization enables and facilitates the connection of clients with companies, the association of data, and a company's processes. Communication through certain technologies is easier for everyday activities in the company; it is much faster and more efficient. It helps us save time and costs.

The following are the benefits of digitalization in a business:<sup>45</sup>

- the level of business efficiency has increased
- operating costs are reduced
- increased possibilities of overall data analysis
- increase security while storing data in the cloud
- definitely less possibility of mistakes in people (because a lot of software and certain programs take over)

In addition, among the more essential features of the application of digital technology that enables the creation of innovative business models is:<sup>46</sup>

- application of digital technologies with the synergy of services arising from them. That may include; content storage, location services, interactivity, predictive analytics, and the like
- incorporation into products and devices, the ability to extract digital content from devices, then their analysis and interaction. That would mean sensors in the IoT. As an example, Michelin incorporates tire wear sensors into its tires, causing the tire to turn red when unsafe to drive or unsuitable for the weather.
- intensive exchange of digital content
- ability to digitize business, digitally transform business models and create digital platforms

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<sup>45</sup> “What Is the Role of Digitalization in Business Growth?” *Factory.hr*, 22 May 2020. Available at: <https://factory.hr/blog/digitalization-business-growth>. (23 August 2021)

<sup>46</sup> Ibid.

### 3.4.1. Innovation through new technologies

Innovation is something without which few companies can survive in the market today. Due to the growing competition from day to day, it is crucial to invest in various innovations in the company, and with it comes digitalization.

Digital innovations like Artificial Intelligence (AI), the Internet of Things (IoT), Cloud, and various sensors with many capabilities are transforming manufacturing and almost all aspects of business in all industries. They play a significant role in business, and with their daily use, they help in the better success of a company.

AI and IoT are making progress in production, from consumer goods to cars. Optimized production processes also adapt to changes in consumer demand, which also significantly helps the business itself. Then the cloud-based software provides real-time insight into supply chain logistics. Machine learning brings vital insights that help product planners, retailers, and budget makers do better jobs. Various of these innovations are changing the business and improving it day by day.<sup>47</sup>

In addition to the significant digital innovations AI, IoT, Machine Learning, Cloud-based software, other innovations significantly help the business, and these are:<sup>48</sup>

- Robotic Process Automation: this is software to automate business processes, such as processing transactions, interpreting some applications, replying to e-mail, and working with data. As its name suggests, it automates repetitive tasks that connect people to time and productivity. It is such a promising innovation that it can automate some more complex functions that include the work of programmers, some project managers, business analysts, consultants, and the like

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<sup>47</sup> Salesforce.com. (n.d.). *The Benefits of Digital Transformation*. [online] Available at: <https://www.salesforce.com/products/platform/why-business-need-transformation-innovation/?d=nav-next>. (25 August 2021)

<sup>48</sup> S.S.M. 17 (2019). *Eight innovative technologies that are changing business*. ITProPortal. Available at: <https://www.itproportal.com/features/eight-innovative-technologies-that-are-changing-business/>. (25 August 2021)



- Edge Computing: is a distributed computing paradigm that brings computing and data storage closer to data sources. It is a form of distributed computing sensitive to topology and location
- VR / AR: Virtual reality and augmented reality are other forms of digital innovation. VR immerses users in the environment, and AR improves that environment. Both offer huge potential in terms of training, entertainment, marketing, and education. They can be used to train physicians to perform surgeries, museum visitors for a more profound experience, a better theme park experience, and better marketing. All it takes to get started with VR or AR is good programming and advanced thinking.
- Blockchain: This is a technology that is associated with cryptocurrencies like Bitcoin. It offers a high level of security because the data can only be added, not taken away or altered. In a blockchain, there is no need for a third party to monitor transactions.
- Cybersecurity: it continues to evolve as new threats keep popping up. Various hackers continue to try to access data illegally, although strict security measures have already been developed, and for this reason, cybersecurity still needs to be upgraded and improved.

### **3.4.2. Changes brought in by digitalization**

Digitalization brings significant changes, some of them are positive, and some can have a negative impact. Although so far, it has been proven to bring us more optimism. It affects a variety of organizations, people, and the business itself. We can divide it into three categories affected:<sup>49</sup>

- Economy
- Society
- Governance

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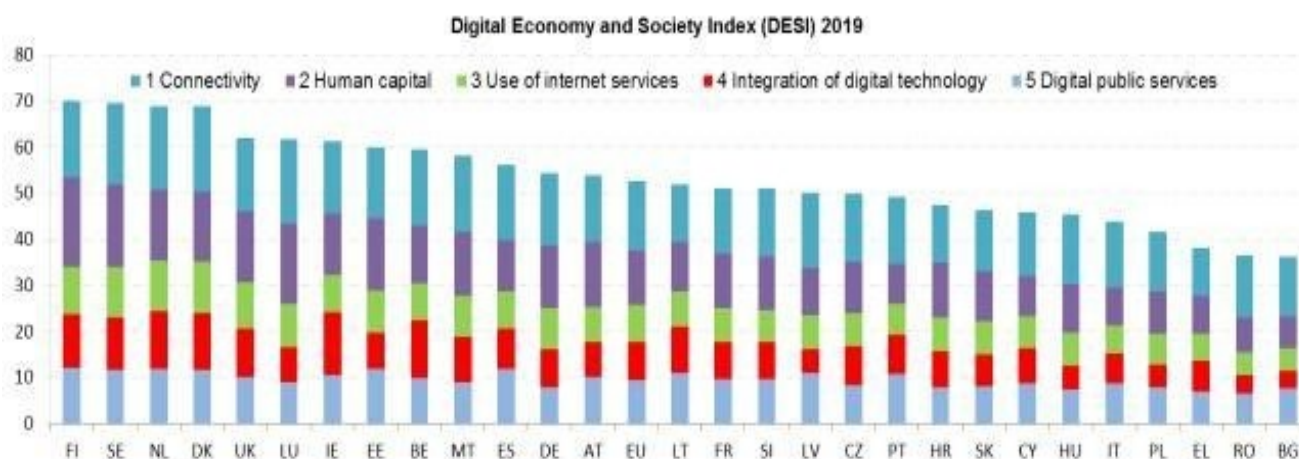
<sup>49</sup> Sabbagh, K., El-Darwiche, B., Friedrich, R. and Singh, M. (2012). *Maximizing the impact of digitization*. Available at: <https://www.strategyand.pwc.com/ml/en/reports/maximizing-the-impact-of-digitization.pdf>. (26 August 2021)

It certainly has a significant impact on the economy and its overall development. It affects GDP per capita growth, job creation, and innovation explicitly. Companies that have decided to introduce digital technology have certainly helped them and brought new business opportunities. For example, achieving increased profits and sales, increasing internal efficiency, and reducing operating costs. For example, a study showed that digital technology, Big Data, significantly helped the bank and increased sales and profits by 25%, which means a lot.<sup>50</sup>

Digitization has a significant impact on a country's social well-being. In 2020, the European Commission published its annual DESI (The Digital Economy and Society) index. In which it is clear that Croatia ranks 20th among the 28 EU member states.<sup>51</sup>

What Figure 15 shows.

Figure 15: Digital Economy and Society Index (DESI) 2019



Source: European Commission - European Commission. (2019). *Press corner*. Available at: [https://ec.europa.eu/commission/presscorner/detail/en/MEMO\\_19\\_2933](https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_2933). (26 Aug 2021)

<sup>50</sup> Novosel Vučković, S. (2020). *Digitalizacija cjelokupnog gospodarstva – najvažnija reforma koju još nismo proveli*. [online] Poslovni.hr. Available at: <https://www.poslovni.hr/poduzetnik/digitalizacija-cjelokupnog-gospodarstva-najvaznija-reforma-koju-jos-nismo-proveli-361824>. (26 August 2021)

<sup>51</sup>European Commission - European Commission. (2019). *Press corner*. Available at: [https://ec.europa.eu/commission/presscorner/detail/en/MEMO\\_19\\_2933](https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_2933). (26 August 2021)

Figure 15 shows that Croatia has good results in fixed broadband coverage, but unfortunately, achieves poor results in connectivity. Of all the categories, it shows the best results in the human capital category and ranks eighth in terms of the share of people with a degree in IDT. In addition, Croats are among the most numerous readers of online news in the EU, and Croatian companies take advantage of various opportunities for social media, big data, and e-commerce.

The last impact listed here is that digitalization is also affecting governance. This could include transparency, e-government, and education, which is also very important for the success of a country.<sup>52</sup>

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<sup>52</sup> Sabbagh, K., El-Darwiche, B., Friedrich, R. and Singh, M. (2012). *Maximizing the impact of digitization*. Available at: <https://www.strategyand.pwc.com/m1/en/reports/maximizing-the-impact-of-digitization.pdf>. (26 Aug 2021)

## 4. BUSINESS PROCESS MANAGEMENT ALONG WITH DIGITALIZATION IN INFOBIP

### 4.1. *The beginnings of the establishment of Infobip*

Infobip is a global IT and telecommunications company. It was founded in 2009 in Vodnjan (a place near the city of Pula) and the first Croatian company in the ICT sector. It specializes in processing, delivering, and billing SMS and voice messages, phone calls, notifications, e-mail, and messages via messaging applications.

It is especially prominent in the segment of the system for sending SMS and MMS messages. They helped the business with a "cloud" solution that allows users to freely use all the data on various connected devices while naming the brand Mobile Services Cloud.<sup>53</sup>

Their clients are most often social networks, various Internet companies, mobile messaging applications, marketing agencies, various non-profit organizations, and banks, which we will mention below under Chapter 4.3.

The company's management started in Vodnjan in a small garage with ten employees, while now they have headquarters in London, Zagreb, and Pula. They have regional offices in Buenos Aires, Sao Paulo, Istanbul, Kuala Lumpur, Bangkok, Vancouver, Dubai, and other countries. It is known as the largest IT company in terms of employees and was declared in 2016 as the most significant Croatian exporter in the IT sector.<sup>54</sup>

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<sup>53</sup> UJAK - Hrvatska udruga Java korisnika. (2013). *Član – Infobip*. Available at: <https://hujak.hr/clan-infobip/>. ( 26 Aug 2021)

<sup>54</sup> Personal data, communication with an Infobip employee

Infobip is a member of the GSM Association, groups such as the Mobile Ecosystem Forum, the Mobile Marketing Association, and the Mobey Forum. It also has various certifications, such as PCI DSS certification, confirmation of compliance of its systems with security standards in the card industry, in the domain of sensitive data delivery, such as credit and payment card PINs.<sup>55</sup>

#### **4.2. *The benefits that digitalization has contributed to the firm***

In addition to starting a business in a tiny garage, they created a business without advanced technology. Their workload was constantly increasing, and they only used Excel to calculate all the data. This made their business more difficult. The organizational structure suffered; there was a greater possibility of mistakes compared to today. After a while, they decided to introduce some programs to make work organization easier because the volume was increasing day by day. The digital technology that has contributed to Infobip's growth can be cited as:<sup>56</sup>

- The introduction of Microsoft Dynamics CRM helped them significantly improve sales, analyze business data and, very importantly, save time and money as the business grew significantly.
- Then the introduction of Salesforce software - this software makes it even easier and simpler for the company to view data; each task is monitored regardless of the sector at any time the Infobip Management can see what benefits the current business brings and monitoring it. There is also a reporting view in this software program, which they call a dashboard view in which managers have easier access to all the data and all the actions performed by employees. They can review who is doing what task and how they are

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<sup>55</sup> Infobip. (n.d.). *Vodnjan*. Available at: <https://www.infobip.com/offices/croatia-vodnjan>. (26 August 2021)

<sup>56</sup> Personal data, communication with an Infobip employee

doing it. This serves them to assess which employee is doing a better job and which a little less. It also uses them for group data statistics and completed projects. As mentioned above, they do business in multiple countries, so this software allows them to view data related to the cities in which they work. It also allows them a percentage of success in various sectors, such as retail, banking. The significant advantage is that it offers real-time access to all data; you can control the work every minute and see some error that can correct it immediately and react in time. This gives the company greater efficiency, productivity and makes it easier for the leader to monitor all sectors.

- Introduction of OKR tools - helps to set goals that all employees use. It also helps track the progress of goals and creates coherence. Infobip has developed into a massive company in which the key to success is the organization of the entire business. The employee organization, tasks, group projects, different sectors, and more. With this tool, they accelerated the achievement of goals. In addition, it is possible to estimate how many plans will be successful by the end of the year and how many will not, which are stuck and need a little push, and some of them are certainly going without difficulty. All employees can see with the OKR which department is doing which task/project and know its details. This made it much easier for Infobip to plan and coordinate the entire business.

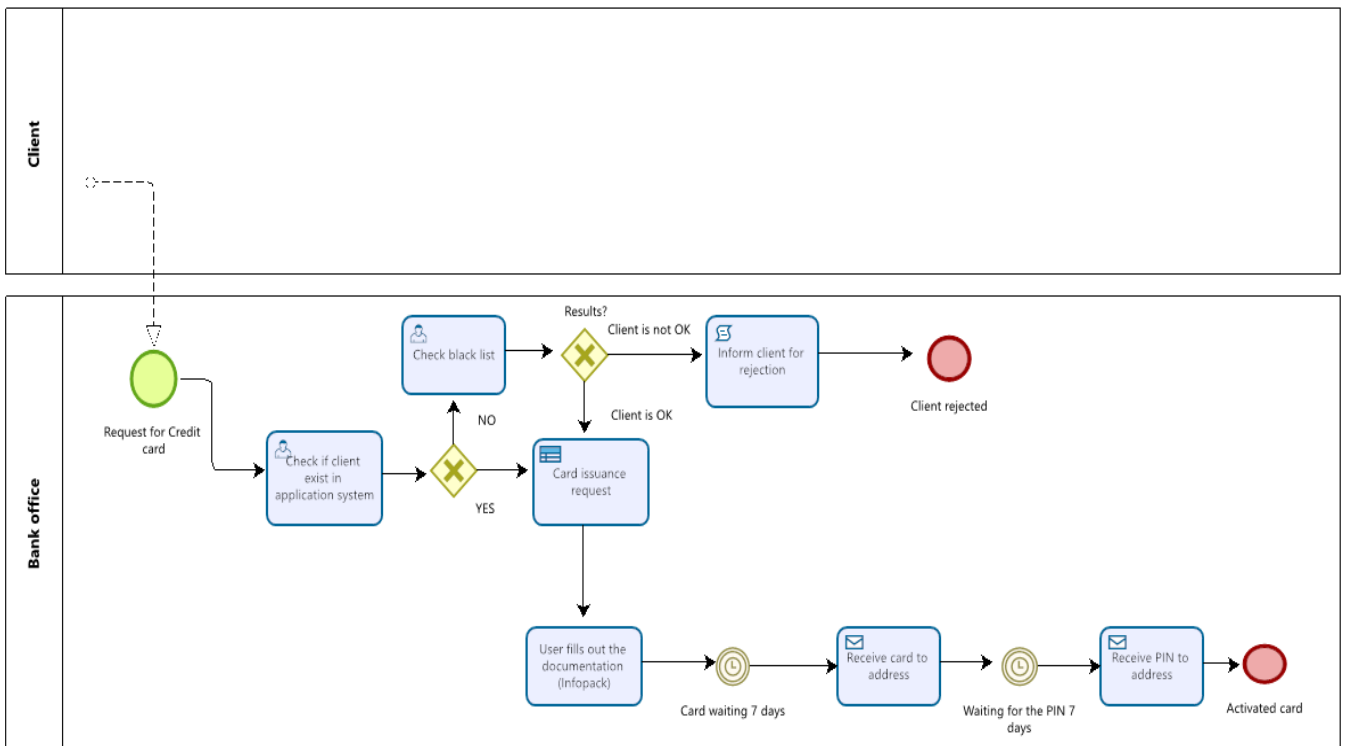
### **4.3. *Analysis of AS-IS model – process in Sales sector***

The following Figure 16 will show the AS-IS model showing the card issuance process in Bank. The procedure begins at the bank, where the client comes to the counter. The bank employee receives it and checks in the system whether the bank user or not. If he is a bank user, he is issued a request for the issuance of a card. The employee hands him a document (Infopack) that needs to be signed and moves on to the further procedure.

The user fills out a document and a 7-day check for the card to arrive at his address. Once the card arrives, another 7 days are waiting for the PIN to arrive. After that, the card is ready for use.

If the client is not a bank user, he is checked on the Blacklist; he is on it; his request is denied. If the user is not on Blacklist, the same procedure is repeated above. A document (Infopack) is handed to him, the user fills in, and waits 7 days for the card and 7 days for the delivery of the pin. After that, the card is ready for use.

Figure 16 - AS-IS model of card issuance request



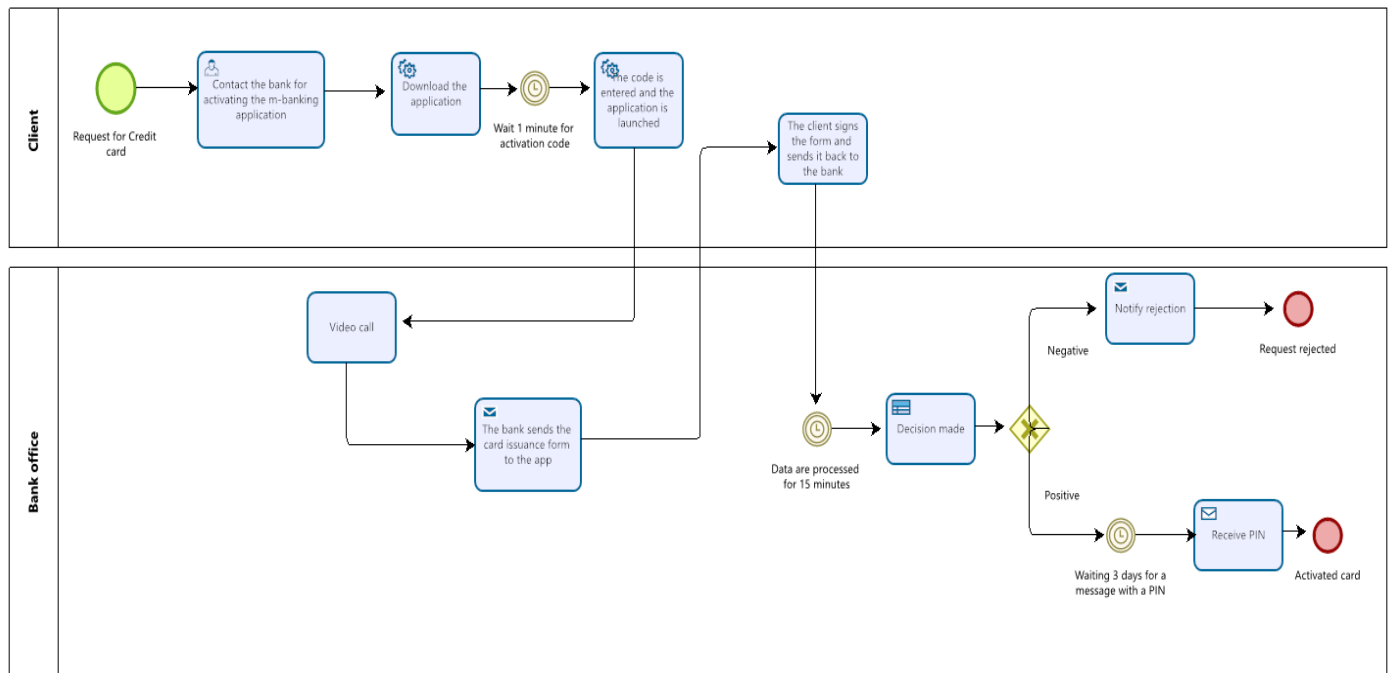
Source: Author's work

#### 4.4. Analysis of TO-BE model – process in Sales sector

While Figure 17 shows the TO-BE process for issuing a card through an e-branch. In this model, the bank's user talks on the phone with a bank employee and asks to be allowed to activate m-banking to request a card issuance request online. The client needs to download the application and automatically receive the activation code for m-banking.

The user enters the activation code, and the application is ready for use. He arranges for a bank employee through a video call and immediately sends him a form (application form) for issuing a card in the application. The client sends the bank an electronic signature and a completed form, and the bank receives it. The bank makes the decision. If the decision is negative, the request is rejected. If the decision is positive, the client waits 3 days for the PIN to arrive on his mobile phone, after which the card is ready for use. This model is more advanced in terms of technology. You do not have to wait for the card and pin for 14 days to arrive by mail as in the TO-BE model, but everything is resolved within 3 days.

Figure 17 - TO-BE model of card issuance request





Infobip was mentioned in the chapter above because they were the ones who provided banks with a service like sending automatic messages. Sending PINs via SMS, thus speeding up the process. In addition to sending the PIN, activation codes are also sent automatically as soon as a request for m-banking is received. Today's technology has enabled various industries to accelerate processes, including the banking industry. In this way, step errors are reduced, and more is automated.

## **5. CONCLUSION**

By researching and studying the literature of this paper, it can be concluded that without advanced technology, digitization, and knowledge of business process management, it would be difficult to sustain the growth of an organization or enterprise. The use of digital technology significantly helps the company's development, helps in the speed of task execution, increases employee efficiency, reduces the possibility of mistakes, and makes the job more challenging and interesting. It brings with it and will bring benefits as digitalization continues to evolve day by day and, of course, brings various challenges that affect the organization's management. That is why the founders of the company need to follow the trends and constantly adopt new technologies. In addition to adopting new technology, companies must properly manage business processes. Business process management brings various benefits, such as increased business agility, efficiency, and effectiveness.

It can be concluded that using digital technology or digitalization with proper business process management can bring great success to companies. To succeed, you must know how to adapt to change, and management must constantly examine systems and know the market. The paper

cites the fastest growing Croatian company in the IT sector that has developed some of the digital technologies that have significantly contributed to the growth of companies. It can be said that Infobip is an example of a company that properly uses and creates advanced digital technology with excellent use of business process management.

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- Primary answering the phone
- welcoming guests and saying goodbye
- arranging around rooms if something is wrong
- entering data into a computer in a program when checking in and check out
- communication with guests

**1 JUL 2016 – 1 SEP 2016** – Pula, Croatia

### Front desk receptionist

Arena Hospitality Group

- Primary answering the phone
- welcoming guests and saying goodbye
- arranging around rooms if something is wrong
- entering data into a computer in a program when checking in and check out
- communication with guests

**1 JUL 2017 – 15 SEP 2017** – Pula, Croatia

### Exchange office worker

Terra Dolce

- Communication with customers
- Recognizing different banknotes ( includes a lot of world banknotes )
- Responsibility when receiving money and when returning another currency
- Entering the amount in the program in the computer and issuing the invoice
- Cash count (large amount of money)

**1 JUL 2018 – 15 SEP 2018** – Pula, Croatia

### Exchange office worker

Terra Dolce

- Communication with customers
- Recognizing different banknotes ( includes a lot of world banknotes )
- Responsibility when receiving money and when returning another currency
- Entering the amount in the program in the computer and issuing the invoice
- Cash count (large amount of money)



1 JUL 2019 – 1 SEP 2019 – Pula, Croatia

**Junior accountant**

Conis d.o.o.

- Receiving emails and checking them

- Informing employees about important emails and dates
- Stacking accounts and sorting each company into its own drawer
- Creating tables in Excel and data entry
- Posting incoming and outgoing accounts
- Posting Statements
- Checking the debit and credit side and checking the entire balance sheet

1 JUL 2020 – 1 SEP 2020 – Pula, Croatia

**Junior accountant**

Conis d.o.o.

- Receiving emails and checking them
- Informing employees about important emails and dates
- Stacking accounts and sorting each company into its own drawer
- Creating tables in Excel and data entry
- Posting incoming and outgoing accounts
- Posting Statements
- Checking the debit and credit side and checking the entire balance sheet

**LANGUAGE SKILLS**

**MOTHER TONGUE(S):** Croatian

**OTHER LANGUAGE(S):**

**English**

Listening C2	Reading C2	Spoken production C1	Spoken interaction C1	Writing C1
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**Italian**

Listening B1	Reading B2	Spoken production A2	Spoken interaction A2	Writing B1
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**DIGITAL SKILLS**

Microsoft office(WordExcel Powerpoint Outlook) / Team-work oriented / Organizational and planning skills / Good listener and communicator / Motivated / Responsibility / Microsoft SQL (basic) / Social Media / Digital Marketing / MS-Powerpoint / Microsoft word, Excel / Facebook / Skype / Gmail / WhatsApp / Social Media Management (Facebook, Twitter, LinkedIn, YouTube, Instagram)