

New Employment Technologies

The Benefits of Implementing Services Within an Enterprise Architecture Framework

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Labor Markets Division

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ABSTRACT

Public employment services (PESs) are offered through different channels to employers looking for workers and job seekers looking for work or requiring unemployment benefits. The multiplicity of services and channels, paired with processes that are sometimes not adequately mapped, creates challenges during the implementation of digital systems. This document analyzes how the use of enterprise architecture can provide a framework that helps to define and represent a high-level view of the organization's processes and information technology (IT) systems, as well as their relationship with various parts of the organization and external entities*.

Having a strategic vision and a high-level design facilitates the implementation of systems in phases and modules, as well as the organization of the services the PES provides in terms of efficiency and effectiveness. This document also presents examples of how new processes and systems yield greater benefits when implemented strategically within an enterprise architecture framework rather than when implemented in an isolated manner. This publication is aimed at helping decision-makers, as well as managers and officials in charge of employment policies, to fully appreciate the benefits of implementing a wide-ranging digital transformation in labor intermediation institutions within the framework of a strategic tool such as enterprise architecture.

* See <https://www.opengroup.org/>

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ACRONYMS**

EA: Enterprise architecture

API: Application programming interface

BA: Business analytics

BI: Business intelligence

COTS: Commercial off-the-shelf

CRM: Customer relationship management

DWH: Data warehouse

ECM: Enterprise content management

ESB: Enterprise service bus

ETL: Extraction, transformation and load

AI: Artificial intelligence

IoT: Internet of Things

IVR: Interactive voice response

PwD: People with disabilities

PCCS: Petitions, complaints, claims and suggestions

LIS: Labor intermediation system

SMS: Short message service

PES: Public employment services

IT: Information technology

** A glossary of terms can be found in Annex 2. Throughout the publication, brief definitions of some of the concepts and links to the glossary have also been included. These are repeated throughout the text to assist readers who are not necessarily reading the entire document, who do not read the chapters consecutively or who simply want to refresh their memory on a concept when they return to it after a period of time.

INTRODUCTION

Modernizing public employment services (PESs) or any associated service requires an understanding of the steps prior to system implementation. When determining the initial steps and defining the best possible modernization process, **enterprise architecture** (EA) plays a fundamental role as a strategic tool.

PESs are those services through which “planning and execution of many of the active labor market policies used to help workers find jobs and companies fill vacancies” occurs. They also facilitate labor market adjustments and cushion the impact of economic transitions.¹ Improving the performance of a PES requires process improvement and the use of new technologies.

PESs contribute to countries’ social and economic development to the extent that they are created to help job seekers face the difficulties of the labor market—particularly those who, due to their profile, are not part of the target group of private employment services or talent scouts, as well as those who require additional support in job searches, job training or orientation and other areas.²

In a context in which users and companies seek quality and efficiency through PESs, improving their provision is a permanent challenge. Public and private employment services do not necessarily compete with each other because they specialize in different target audiences. However, users sometimes perceive them as competitors and note the inefficiencies that occur in PESs

1. BID, WAPES, OECD (2015).

2. In some cases, PESs also provide unemployment benefits.

that use manual processes and rely on paper; such practices also discourage the private sector from registering their vacancies with PESs.³

Establishing a labor intermediation system (LIS) in a country requires that private and public employment services complement each other and share information. A precondition for this is the use of appropriate technologies⁴ that can serve as tools to promote joint work. For example, artificial intelligence (AI) engines can be used for labor intermediation, which can serve as a basis for coordinating with private services and by providing them with the technology to complement the information required to implement appropriate labor market policies.

The provision of quality services can go hand in hand with a **digital transformation** process. In the case of PESs, this ranges from the elimination of paper-based document management or manual processes to automation, online management and the incorporation of new technological elements such as AI,⁵ data science, robotization, cloud services,⁶ machine learning and the Internet of Things (IoT).⁷ Tools such as self-management, the availability of online procedures, automation, systems **interoperability** and relevant,

3. Manual processes sometimes generate distrust among employers about how candidates were selected. This happens because such processes are more susceptible to unintentional human error, such as mismatching applicants with job offers. They also tend to be lengthy, among other problems.

4. The primary benefit of having vacancy information in private and public employment services is cost savings in defining effective labor market policies and guiding job training systems to produce the skills that employers actually require. By using anonymized data from a labor intermediation system, data collection costs are avoided, and decision-makers benefit from a constant flow of job profiles. Cost efficiencies can also be achieved when new technologies such as AI systems are implemented for labor matching. For more information on the benefits of these technologies, see Urquidi and Ortega (2020).

5. Additional information on the use of AI in labor intermediation can be found in Urquidi and Ortega (2020).

6. For best practices in procuring cloud services, see Garcia et al. (2020).

7. In the public management arena, the IoT can be used in multiple activities ranging from obtaining input information to defining training needs. See, for example, <https://u-gob.com/internet-de-las-cosas-iot-en-gobierno-9-aspectos-para-implantarlo/>

predictive and timely information⁸ are part of the toolbox that traditional services require to respond to current and potentially more demanding digital users.⁹ This happens because people demand new types of services, including innovative modalities through which they can interact using new service channels.¹⁰ Service improvement through technology also reduces paper consumption and, therefore, the impact on the environment; it also facilitates access for people with disabilities (PwD)¹¹ and those who live far from the PES offices, all in an effort to expand connectivity.

Digital transformation is characterized as a continuous process that can become complex because success requires the participation of several components of an organization. In addition, any process automation involves the adoption of digital technologies by key stakeholders, which can entail high costs for the organization and a lengthy adaptation process. As discussed below, a high-level EA allows for the definition of priorities and the introduction of a modular implementation approach. This makes the project more manageable and produces rapid results within the framework of a long-term strategy and implementation plan. Likewise, by generating synergy between various sectors, it is possible to achieve efficiency in the use of funds and avoid redesigning necessary processes and systems if, during the initial implementation, some aspect of functionality was not considered.

Before initiating IT projects, it is essential to pay attention to the design and implementation strategy of the products, processes and technologies. To do

8. See ECLAC (2011).

9. For the purposes of this publication, a user is considered digital when they habitually use a digital product or service.

10. For a map of services and associated service channels, see Annex 1.

11. For more information on good access practices, see, for example, <https://www.w3.org/standards/webdesign/accessibility>

so, it is important to start by modeling a plan that aligns the technological infrastructure components and the information and management systems with the business objectives. It must also cover all the needs, times and processes of the ecosystem in all its phases to ensure scalability, flexibility and connectivity with other existing systems. It is precisely here that EA serves as a strategic tool to visualize these interactions and synergies and to understand the interrelationships in an entity's processes and, in many cases, their interdependence.¹²

When systems are established without analyzing these correlations and interdependencies, and without having a strategic vision of the whole, there is a risk of implementing isolated projects that will soon fail to meet the stipulated objectives. This requires adjustments to systems and processes that entail long-term costs or the implementation of complex structures that become obsolete as the **digital transformation** progresses within an institution.

For example, in most ministries of labor, there are two services, one for job seekers and the other for registering employers. As they are located in different areas, both have their own service systems and self-management portals that generate separate and isolated records. This means that a company has to register again when it wants to register its vacancies, even though all its information is already in one of the ministry's systems, thus duplicating the costs of implementation and the maintenance of systems that are already highly compatible. In contrast, with a unified process, the linkage between the

12. Between 2017 and 2021, the authors of this paper worked with several PESs in Latin America to understand their processes. One of the constants was that, when carrying out the architecture definition process and analysis together with staff from different areas or entities, the information produced by one area of a ministry or entity was used by another, so small adjustments in the way such information was collected could generate efficiencies not only in that area, but also in others or even in the entity as a whole. It was in this context that EA began to be used as a tool to identify these synergies and correlations; this is where many of the lessons learned in this document come from.

latter could generate savings and provide a single view of citizen interactions and available services. This can be achieved through EA which produces a high-level view of the organization's processes, as well as its IT systems and their interrelationship, in a framework in which processes and systems are shared by their various parts.¹³

EA includes a strategic and functional study of the institution, a technology gap analysis in relation to existing systems and a description of the information systems and IT infrastructure. These tasks lead to the production of a high-level design that encompasses the definition of processes, their functional components, data and IT systems. This, in turn, will allow movement toward the design, development and implementation of the systems following industry and social services best practices.

1. FUNDAMENTALS OF ENTERPRISE ARCHITECTURE

One challenge for PESs is to implement technologies in an integrated manner, even though these are often part of separate initiatives or projects. For these services, as for many organizations, defining and executing projects aligned with strategic initiatives is often a complex task. This is due to the lack of a comprehensive vision that encompasses business processes, the technology to support them and the definition of a joint improvement to reach the desired state. This is where EA plays a critical role.

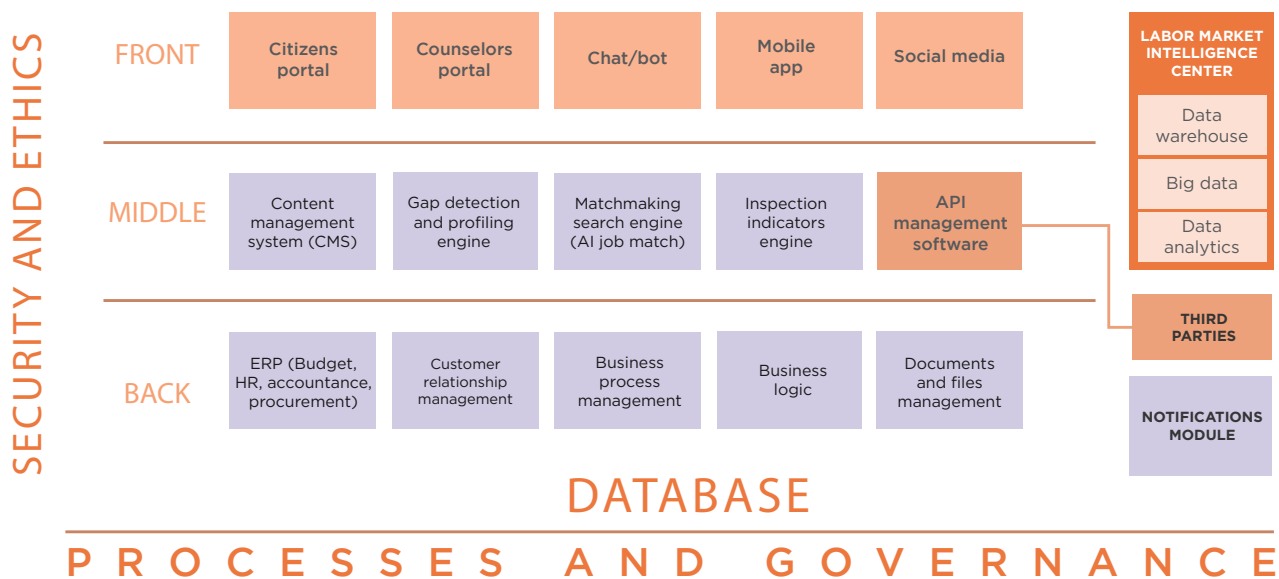
EA refers to the design of a system's structure.¹⁴ It is a process that leads to the definition of a structured solution that satisfies all technical and operational

13. TOGAF standard, V. 9.2.

14. TOGAF standard, V. 9.2.

requirements while optimizing common quality attributes such as performance, security and reusability. EA also involves making a series of decisions based on a wide range of factors, each of which can have an impact on the system's quality, performance, maintainability and overall success.

FIGURE 1: EXAMPLE OF A HIGH-LEVEL ARCHITECTURE DESIGN



SOURCE: SELF ELABORATION

EA can be compared to the executive design of a neighborhood project in a city. First, the urban vision and mission are established, as are the purpose and expected benefits for the future occupants. Then, with the appropriate tools, components ranging from the general lines to the details of the project are designed. The design concatenates the strategic objectives of the neighborhood with the components in their various dimensions such as streets, recreation and circulation areas. Finally, it is time for the design of the physical infrastructure, such as electrical installations, water systems and parking lots, etc., using the respective technical specifications that guide the builders and ensure sustainable and scalable work. Good design will facilitate

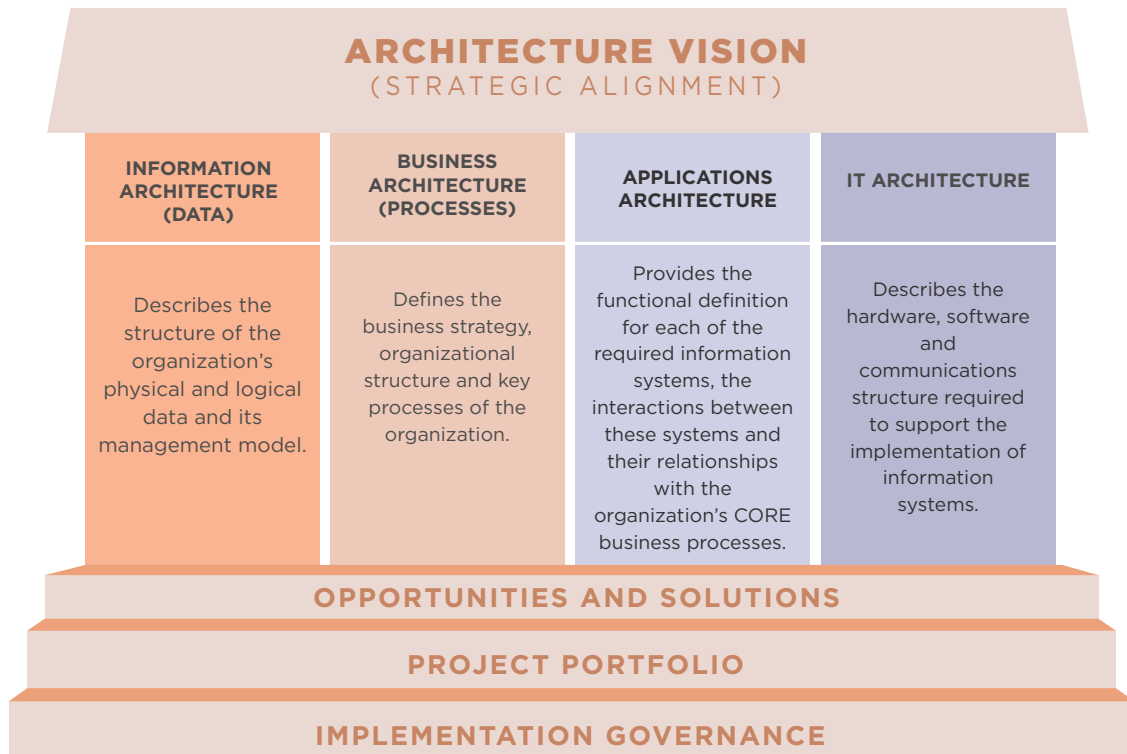
the orderly future growth of the neighborhood without affecting the urban vision and its common components.

EA allows for the implementation of programs and projects with appropriate governance. This makes it easier for modules to be implemented over time, reusing previously installed parts within the framework of a roadmap in which priorities and timelines are aligned with the objectives of the PES. It is possible, for example, to achieve specific milestones in a short period of time, followed by modules with clearly visible priorities, timing and financial resources and which, as they are implemented, generate consistent, timely and comprehensive functionalities and data.¹⁵

EA is an analysis discipline that encompasses four main dimensions: information (data), business (processes), applications and technology (IT). These are described in Figure 2.

15. EA allows for a high-level design of processes and systems. In that sense, it is a strategic tool. However, its objective is not to define a future state or the entity's goals. It is a tool that complements others with which the entity's mission or future vision is strategically analyzed, allowing processes and changes to be aligned with that future vision without replacing it.

FIGURE N°2 LAYERS AND DEFINITIONS OF ENTERPRISE ARCHITECTURE



SOURCE: THE OPEN GROUP

The information architecture (data) layer analyzes the internal and external flow of data, ensuring its integrity throughout the processes. The business architecture (processes) covers the end-to-end design of PES services, whereas the application architecture establishes the components of the required information and management systems. Finally, the technological architecture defines the infrastructure requirements needed to support the software components, platforms and services defined in the application architecture. All of the above must be aligned with the mission objectives of the PES.

When executed as part of the implementation of technologies,¹⁶ EA produces multiple benefits, which are described below:

- **It generates agility and quality of service** for users and companies, given that, by improving the institutions' performance, new high-impact functionalities modules can be prioritized and managed. Having systems that reuse information means that users do not have to provide their data every time they initiate a new procedure; they simply authorize the use of the information they consider relevant, which is already in other administrative records.
- **It reduces costs** for institutions and users by incorporating standards that can be reused repeatedly. This results, for example, in reduced paper consumption and fewer user visits to PES offices, thanks to online self-management.
- **It increases the transparency and reliability** of data and indicators through proper design and management. One benefit, from the user's point of view, is that data updated in one procedure can be reused by citizens in other procedures with the entity.
- **It operates as support** for the online government or digital government strategy, which implies, for example, offering online procedures or facilitating greater access to PES services for PwD and other vulnerable groups.

16. TOGAF standard, V. 9.2.

- **It prompts sustainability** of information and management systems over time for the PES through the execution of changes in an orderly, flexible, documented and agile manner.

It is important to employ an EA design to make strategic decisions that help ensure results. Some of these decisions include alignment with current regulations, the preparation of work teams, the definition of governance strategies, the provision of technological infrastructure and software development and the adoption of project management methodologies.

An example of the benefits offered by proper design and planning within the EA framework is the implementation of **technological infrastructure** such as protection and cybersecurity systems that harmonizes the needs of multiple areas in a labor ministry. This is achieved through the articulated design of all technological needs and the consolidation of all requirements in a comprehensive database design. This facilitates the provision of services to all areas of the entity by adding and optimizing the design of servers, access networks, perimeter protection and high availability. The benefits will not only materialize in terms of savings, but also come from the quality of service, as well as the cybersecurity obtained by having a single design that covers all the data needs of the different modules, and evenly satisfies the technological infrastructure requirements of multiple areas and modules.

Another example is the document management area, in which the installation of a single platform can provide services to multiple management systems in different areas. This allows the documentation from all procedures, processes and transactions to be archived in a single digital file for each citizen or company, thus avoiding the accumulation of isolated folders and partial and scattered information.

2. HOW PLANNING AND ALIGNMENT WITHIN THE ENTERPRISE ARCHITECTURE FRAMEWORK CAN HELP TRANSFORM PESs¹⁷

EA can be a key element of facilitating the digital transformation of PES services in an orderly, phased manner and, above all, achieving the goals of expanding geographic coverage, remote or self-management channels and the availability of reliable and complete data. All this, together with the protection of information and user privacy based on ethical principles,¹⁸ will lead to useful information for measuring the results of public employment policies.

Once the design is available within the EA framework, the basis for defining the aspects prior to the implementation of those information systems that facilitate its orderly execution becomes available. Some of these aspects are listed below:

- Definition of an approach to the program following a clear methodology that favors alignment.
- Definition of the structure of the programs' work team, including the people involved and the matrix of responsibilities of both areas and suppliers.
- Definition of the programs' governance, which includes decision-making and control committees, meeting rules, decision escalation, information to be reported regarding program progress, performance

17. Several chapters of the document systematize the results of the work carried out for the development of PES architectures in the Ministries of Labor of Paraguay (2015), Colombia (2019), Mexico (2019), Peru (2019) El Salvador (2019) and Bolivia (2019), among others.

18. For more information on ethical data management, see Buenadicha et al. (2019).

indicators and the communication scheme

- Adoption of the procurement and implementation methodology suggested for the different projects, including the cross-referencing of program capabilities vis-à-vis the value chains, to clarify the participation of the different areas in the various projects.
- Definition of a tentative schedule for the execution of phases and modules.
- Definition of the financial plan for the programs (including synergies between sources of financing).
- Preparation of project sheets within the programs containing the background, the current baseline and goals of each project, their expected benefits, their technical support in accordance with the EA, the risks identified and each project's schedule and estimated costs.

EA provides the methodological foundations and the appropriate design to ensure that technologies that support the digital transformation of PESs are implemented and sustained over time within a framework of respect for regulations and the market's best practices.

Although the aspects listed above seem to suggest that the stages that follow EA entail a lengthy process, this is not the case. The scheme provides agility in project implementation because having a general plan makes it possible to start building some parts simultaneously and interconnect them later.

An example of the application of EA as a guide for digital transformation in PESs is the use of job portals and job boards as integrated tools aimed at supporting job seekers and employers in the management of vacancies. Within the EA framework, the design and implementation of services for job seekers facilitates the implementation of the portal in stages, starting with a registration system for job opportunities and job seekers that, over time incorporates new technologies to speed up the work. The basic registration system can provide information to counselors so they can propose alternatives to job seekers, first manually and then through word search tools. This continues until, eventually, an AI brokerage engine that generates a match based on job skills or competencies can be implemented. Subsequently, this system can interoperate with others, providing the ministry's data analysis areas and other entities with reliable and interconnected data. The latter will make it possible to establish what skills are required by the labor market and will serve as a guide in the formulation of labor training policies.

Afterward, all the information generated within the framework of a comprehensive database design will help define goals, determine measurable indicators of success, and monitor the efficiency and effectiveness of various programs. This management by indicators in PESs can also be very useful for measuring improvements in the performance of the systems that support their processes, as well as their adoption levels. Indicators help evaluate results in accordance with the objectives sought. This provides greater clarity on the necessary adjustments and training required by the employers themselves.

3. BEST PRACTICES FOR DESIGNING AN ENTERPRISE ARCHITECTURE

Designing the EA before implementing information and management systems provides greater certainty about implementation results. However, in most cases, PESs already have systems under development, installed or under contract, so EA design is often perceived as an activity that generates additional costs and project delays without adding value. To counteract this erroneous impression, it is important to start with an entity that acts as its promoter and that adopts and understands it as the most appropriate way to manage sustainable information systems that achieve the desired digital transformation. This is true to the extent that it connects the mission objectives of the PES with the information and management systems in all its layers, in addition to producing technical specifications aligned with such objectives.

Some EA design best practices are described below:

- Achieve quick wins to increase motivation and generate results by implementing the early phases of services, as mentioned above in the example of the integrated job board and portal.
- Involve strategic areas such as planning, finance, operations and processes at the highest levels of decision-making.
- Identify all key players and their roles in the EA design and implementation process.
- Clearly shape the programs resulting from the design and maintain consistency between them and the new initiatives or changes to

ensure that all requirements or modifications fit in the framework of the designed EA.

- Align the vision, mission, objectives and main processes of the PESs.
- Pay special attention to information flow, database design and the comprehensive management and security of particularly sensitive data.
- Use documentation tools, training and adoption of architecture concepts to ensure that design and planning guide execution.
- Ensure the preparation of the work teams that will be affected by the transformation programs derived from the implementation of the EA through training, new skills, new roles and a comprehensive change management.

4. CONCEPTS THAT FACILITATE A BETTER UNDERSTANDING OF THE NEW INFORMATION TECHNOLOGIES THAT SUPPORT PES INFORMATION AND MANAGEMENT SYSTEMS¹⁹

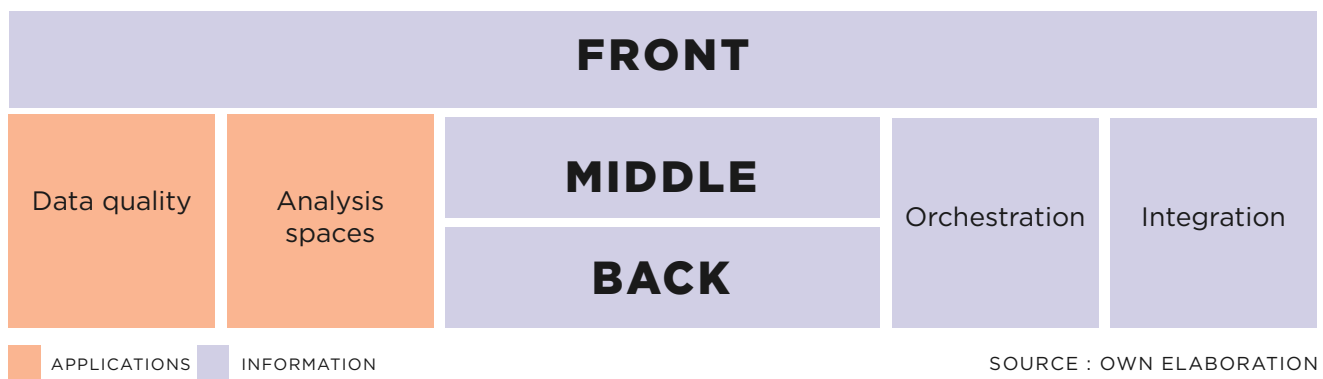
To implement technologies and transform PESs, it is important to understand a number of concepts that will facilitate the implementation of information technologies derived from programs identified within the EA framework.

To facilitate their implementation, information systems can be viewed in three layers: front, middle and back (Figure 3). Their identification and maintenance

19. This section is based on the researchers' experiences in the region's five countries.

are critical to ensure the sustainability of the systems in the future. These three layers are complemented by orchestration, integration, data quality and analysis. Figure 3 depicts them and distinguishes the application layers from the information layers.

FIGURE 3: APPLICATION AND INFORMATION LAYERS IN INFORMATION AND MANAGEMENT SYSTEMS



To facilitate a more complete understanding of the concepts, the functions and examples of the various layers' components are described below.²⁰

Front-end systems: This layer contains the capabilities that allow the systems' various users to interact with the organization's services and processes. They are the gateway to the execution of products and services. Some platforms used in front-end systems include the following:

- Web platforms
- Mobile applications
- Contact centers
- Chatbots

20. The definitions for each layer come from TOGAF Standard, V. 9.2.

- Social networking systems and platforms
- Interactive voice response (IVR)
- Customer satisfaction measurement technologies
- Short message service (SMS)

Middle systems: This layer contains the intermediate capabilities of the business and supports the communication between those layers with which the user interacts and the layers that hold the main capabilities that support the functionality in each case. The following platforms are used:

- Customer relationship management (CRM)
- Line managers
- Document managers
- Docking engines

Back-end systems: This layer contains the capabilities and functionalities that support the development of process activities. It confirms and manages what is requested from the front end:

- Management systems for job seekers, companies, training, etc.
- Services for job seekers such as training, job training, job orientation and migrant orientation
- Labor intermediation systems aimed at addressing issues such as gaps between the job seeker's skills and those required by the employer, etc.
- User relationship systems (e.g., job seekers, companies)
- Documentation manager
- Management indicators for the services provided
- Systems for issuing information at various levels of disaggregation,

quantitative analysis, behavioral analysis, growth predictions for the services provided, information, statistics, predictions and analytics

Integration systems: This layer contains the capabilities and functionalities that enable interoperability with external services:

- Enterprise service bus (ESB)
- Application programming interfaces (APIs)
- Data extraction, transformation and loading (ETL)

Orchestration systems: This layer supports the implementation of the integration architecture pattern. Its objective is to establish a framework (protocols, design and methodology) on which the new systems should be built to avoid structural dependencies between them as much as possible.

Data quality: This layer describes the ability to project, manage and improve the quality of the entity's information, including its consistency, completeness, reliability and integrity.

Analysis spaces: This layer has the ability to analyze, interpret and produce statistical reports, documents and listings that facilitate decision-making (e.g., data intelligence, business intelligence, business analytics).

5. CHARACTERISTICS OF INFORMATION SYSTEMS THAT HAVE A HIGH-QUALITY ENTERPRISE ARCHITECTURE DESIGN

As indicated above, where an EA that connects strategic objectives to the final

design is developed in advance, the digital transformation of PES processes exhibits four characteristics that generate benefits over time: modularity, scalability, interoperability and program focus (best-of-breed). Each of these are described below.

Modularity. A modular approach makes it possible for PES information and management systems to be implemented according to established priorities. This allows the modules involved to be adapted without affecting the system's overall functioning. Modularity also allows for quick wins to show results and increase stakeholder motivation. To manage modular components, each one must have specific functions that can be used repeatedly. This is because components that are connected to each other via APIs, Web services or standard interfaces lead to constant reuse of functions and IT services.

An example of reuse of functionalities or services through APIs is the identity validation function of a job search engine. This almost always takes the form of an API with citizen identity validation systems in a country. It can be used not only when someone signs up to search for a job on a PES portal, but also when the citizen requests a certificate from the employment service. Although it is the same service in both cases, it is invoked by different modules depending on the need. This occurs without having to make two programs because the existing service is reused.

Scalability. Scalability provides adaptability according to the circumstances without the product losing quality. IT systems are scalable when it is possible to manage their growth without having to change parts.

Scalability applies to infrastructure components such as servers, storage and data centers, as well as to databases and to components that depend on orderly and orchestrated growth. In the interest of scalability, it is important to design information systems for layered PESs; this prevents service levels from degrading with organic or even sudden growth in system usage levels.

Interoperability. This allows access to data from other institutions or areas of the labor ministry and contributes to make data from PES information systems (e.g., labor intermediation management, occupational and employability data) available to other institutions when necessary. **Interoperability** is essential for information to be integrated and interconnected. This, in turn, facilitates the management of a significant amount of data and information.

Best-of-breed approach. The information systems development strategy must be defined by combining existing platforms with developments designed to adjust specific functionalities. This makes it possible to reduce the costs and time required to formulate it from scratch by using worldwide proven technologies designed to interoperate in complex systems.

6. CONCLUSIONS

PESs collaborate in labor intermediation as the basis of the business value chain. They also offer a route to employability through programs aimed at active job seekers, as well as other services such as internships and dual training programs that facilitate job seekers' integration into the labor market. The digital transformation of a PES positions it as a competitive institution with a greater impact on citizens in general, due to its wide coverage and diversity of services.

Not implementing an EA in a PES can lead the organization to delay its **digital transformation** in the long run. This occurs because there is a risk that the strategic goals, processes and institutional resources are not aligned when it comes to implementing technologies that help make the services offered more efficient for all users.

In general, a well-designed and implemented EA can leverage the benefits that technology brings by automating PES processes. As a result, the services offered by the PES can provide the information needed to correct inequalities in the labor market, such as gaps between the skills required and those offered. They also make it possible to detect poor quality jobs and increase access to information on specific jobs in different areas of a country, among other things.

Achieving the scalability of services, their modular implementation and integration requires a map to guide the digital transformation. This map can be obtained using EA.

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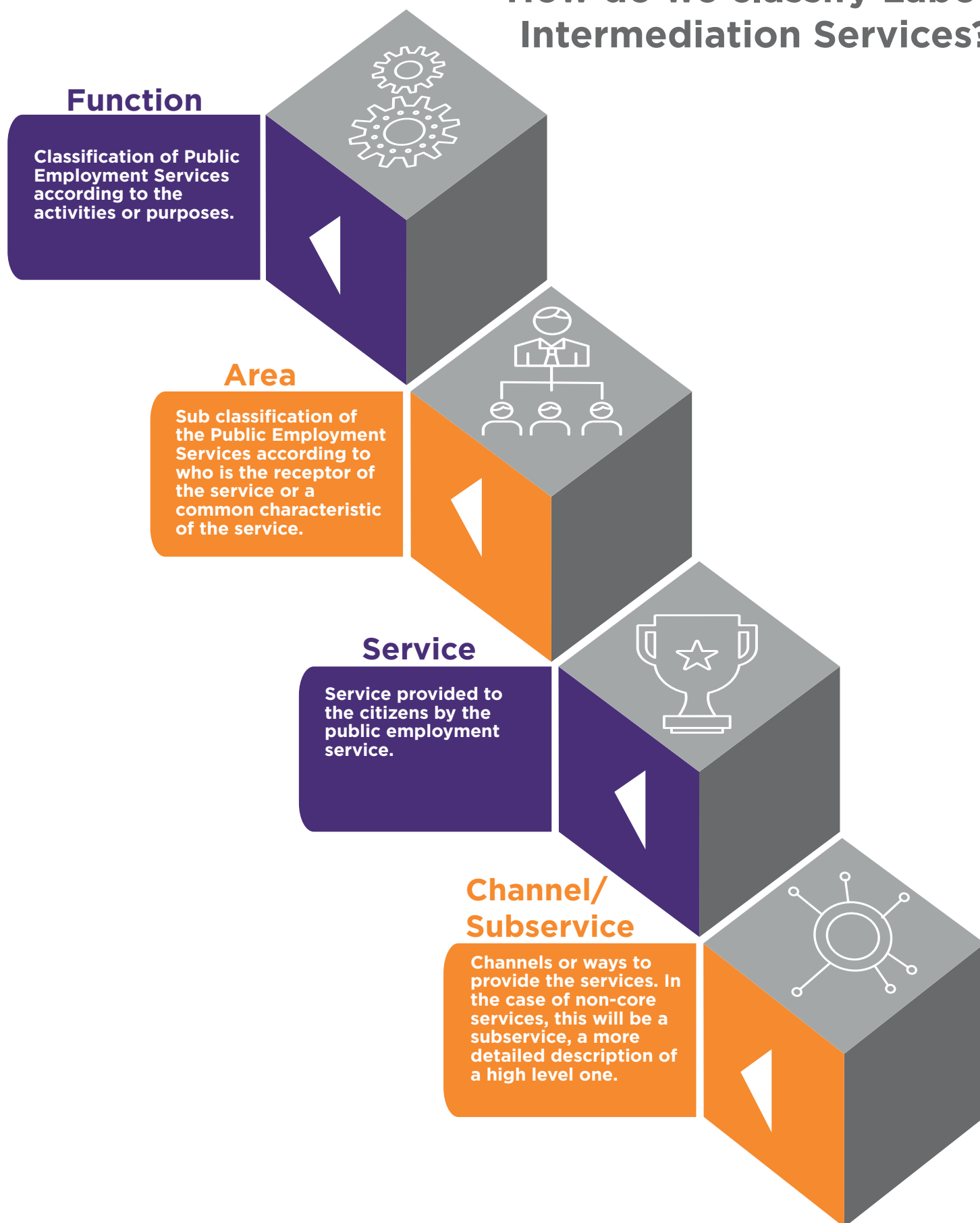
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How do we classify Labor Intermediation Services?



Functions

1. Job brokerage / job placement:
Publicly disseminating job vacancies to be filled in order to facilitate rapid matches between supply and demand.



2. Labor market information:
Collecting data on job vacancies and potential applicants.



3. Active labor market policies:
Policies aimed at adjusting labor demand and supply.



4. Benefits Management:
Including unemployment insurance, social assistance benefits, other benefits.



5. Labor migration:
Labor migration: Coordinating the geographic mobility across borders of people that want to use and develop their skills in a new working environment.



Job Brokerage :

Publicly disseminating job vacancies to be filled in order to facilitate rapid matches between supply and demand



1.1. Services for employers

1.1.1. Registration of open vacancies from employers

1.1.2. Sharing information about applicants with employers

1.1.3. Personal support services for recruitment

1.1.4. Special services for employers

1.1.5. Services for profiling employers



1.2. Services for job seekers

1.2.1. Registration of job seekers

1.2.2. Information about vacancies










1.2.3. Job search support to Job seekers

1.2.4. Services for profiling job seekers












1.1. Services for employers

1.1.1. Registration of open vacancies from employers






-  PES office
-  Post
-  Telephone – Callcenter
-  Telephone - PES placement officer
-  Mobile application
-  Internet web page
-  Email
-  Telephone - Interactive voice response (IVR)
-  Unsolicited, through web scrapping and newspaper digitalization

1.1.2. Sharing information about applicants with employer






-  PES officer at PES office
-  Post
-  Telephone – Callcenter
-  Telephone - PES placement officer
-  Mobile application
-  Internet Web page
-  Email
-  Internet kiosks at PES office
-  Internet through PES Officer






1.1.3. Personal support services for recruitment

-  PES office or employer site
-  Telephone – Callcenter
-  Telephone - PES placement officer
-  Online (Skype, chat)
-  Email

1.1.4. Special services for employers

-  Proposal of pre-selected suitable candidates by PES staff
-  Group information for suitable workers commissioned by employer
-  Personal PES advice/support in case of company crisis (e.g. employment maintenance, lay-offs organization etc.)
-  Computerized matching between job seeker/ vacancy
-  Targeted site visits in selected companies/ branches to raise demand and to develop specific service packages

1.1.5. Services for profiling employers

-  Profiling based only on counsellor/placement officer's assessment
-  Only statistical profiling based on formal models and technical (IT) devices
-  Mixed type of profiling based on placement officer's assessment supported by technical devices











Traditional service













Digital service

1.2. Services for Job seekers

1.2.1. Registration of job seekers









-  PES office
-  Post
-  Telephone - Callcenter
-  Telephone - PES placement officer
-  Mobile application
-  Internet web page
-  Email
-  Telephone - Interactive voice response (IVR)

1.2.2. Information about vacancies




-  PES officer at PES office
-  Post
-  Telephone - Callcenter
-  Telephone - PES placement officer
-  Mobile application
-  Internet Web page
-  Email
-  Internet kiosks at PES office
-  Internet through PES Officer
-  Self-service (displayed at PES offices)



1.2.3. Job search support to job seekers

-  Personal at PES office
-  Telephone - Callcenter
-  Telephone - PES placement officer
-  Online (Skype, chat)
-  Email
-  Web page (practical advices, cv writing)
-  Specialized placement agencies/providers
-  Individual action plans/reintegration agreements defining targets/search activities

1.2.4. Services for profiling job seekers

-  Profiling based only on counsellor/ placement officer's assessment
-  Only statistical profiling based on formal models and technical (IT) devices
-  Mixed type of profiling based on placement officer's assessment supported by technical devices



Traditional service



Digital service

Labor market information:

Collecting data on job vacancies and potential applicants.



2.1. Statistics at national/ regional/local level

2.1.1. Collection of data

2.1.2. Analysis

2.1.3. Dissemination



2.2. General information

2.2.1. Analysis

2.2.2. Dissemination



2.1 Statistics at national/regional/local level

2.1.1. Collection of data

- From administrative records from PES
- From national Census
- From administrative data from other agencies
- From private intermediation agencies
- From social security agencies
- From surveys
- From the internet



2.1.2. Analysis

- In-house
- Contract-out
- Mixed type of profiling based on placement officer's assessment supported by technical devices

2.1.3. Dissemination

- Paper leaflets/brochures
- Post
- Internet Web site - download options
- Email
- Internet kiosks at PES office
- Selfservice (displayed at PES offices)

2.2 General information

2.2.1. Analysis

- Labor market research (beyond monitoring of labor market development)

2.2.2. Dissemination

- Paper leaflets/brochures
- Post
- Internet Web site - download options
- Email
- Internet kiosks at PES office
- Selfservice (displayed at PES offices)



Traditional service



Digital service

Labor market information:

Collecting data on job vacancies and potential applicants.



3.1 Services for employers

3.1.1 Subsidized employment

3.1.2 Training programs

3.1.3 Recruitment Assistance

3.1.4 Self employment schemes



3.2 Services for job seekers

3.2.1 Subsidized employment

3.2.2 Training programs

3.2.3 Job Search Assistance

3.2.4 Self employment schemes



3.1 Labor market information for employers

3.1.1. Subsidized employment



Wage cost subsidies to promote recruitment of unemployed
Work testing/placement into temporary work trial
Temporary work programs
Employment maintenance measures (workers at risk of layoff)
Ex: short time work schemes etc.

3.1.2. Training programs



In-person or online vocational training provided by external organizations



In-person or online vocational training provided by PES
Apprenticeship programs

3.1.3. Recruitment Assistance



In-person job fairs
Online job fairs

3.1.4. Self employment schemes



Self-employment/business start-up assistance



Traditional service



Digital service

3.2 Labor market information for job seekers

3.2.1. Subsidized employment



Job creation measures as additional (public) employment in restricted target areas

3.2.2. Training programs



In-person or online vocational training provided by external organizations



In-person or online vocational training provided by PES



Apprenticeship programs

3.2.3. Job Search Assistance



In-person job fairs



On line job fairs



Self-help brochures or online workshops



Career guidance for active workers



Vocational guidance for youth & adults

3.2.4. Self employment schemes



Self-employment/business start-up assistance



Traditional service



Digital service

Benefits management:

Coordinating the geographic mobility across borders of the people that want use and develop their skills in a new working environment.



4.1 For employers

4.1.1. Dismissal Registration

4.1.2. Confirming job search activity of job seekers



4.2 For job seekers

4.2.1. Registration

4.2.2. Individual action plan









4.2.3. Job Search Monitoring

4.2.4. Payment of benefits











4.1 Benefits management for employers

4.1.1. Dismissal Registration

-  PES office
-  Post
-  Telephone – Callcenter
-  Telephone - PES placement officer
-  Mobile application
-  Internet Web page
-  Email
-  Telephone - Interactive voice response (IVR)



4.1.2. Confirming job search activity

-  PES office
-  Post
-  Telephone – Callcenter
-  Telephone - PES placement officer
-  Mobile application
-  Internet Web page
-  Email
-  Telephone - Interactive voice response (IVR)



Traditional service



Digital service

4.2 Benefits management for job seekers

4.2.1. Registration



PES office
Post
Telephone – Callcenter
Telephone - PES placement officer
Mobile application
Internet Web page
Email
Telephone - Interactive voice response (IVR)

4.2.2. Individual action plan



PES office
Post
Telephone – Callcenter
Mobile application
Internet Web page
Email



4.2.3. Job Search Monitoring



PES office
Post
Mobile application
Internet Web page
Email

4.2.4. Payment of benefits



Bank deposit and letter to reciever
Online transfer and online confirmation



Traditional service



Digital service

Labor migration:

Coordinating the geographic mobility across borders of people that want use and develop their skills in a new working environment.



5.1 For national employers

5.1.1. Registration

5.1.2. Sharing information abroad about vacancies

5.1.3. Supporting services



5.2 For foreign employers

5.2.1. Registration

5.2.2. Sharing information about vacancies

5.2.3. Supporting services



5.3 For national job seekers

5.3.1. Registration

5.3.2. Foreign vacancies information

5.3.3. Supporting services

5.3.4 Training support (special skills for working abroad)



5.4 For foreign job seekers

5.4.1. Registration

5.4.2. Foreign vacancies information

5.4.3. Supporting services



5.1. Labor migration for national employers

5.1.1. Registration



- PES office
- Post
- Telephone - Callcenter
- Telephone - PES placement officer
- Mobile application
- Internet Web page
- Email
- Telephone - Interactive voice response (IVR)

5.1.2. Sharing Information abroad about vacancies



- PES office
- Telephone - PES placement officer
- Telephone - Callcenter
- Mobile application
- Internet Web page
- Email



5.1.3. Supporting services



- (Pre-)selection of suitable candidates and proposal to employer
- Support for the relocation of applicant's families
- Assistance in hiring job seekers from abroad
- Computerized matching between job seeker/ vacancy











Traditional service












Digital service

5.2. Labor migration for foreign employers

5.2.1. Registration





-  PES office
-  Post
-  Telephone - Callcenter
-  Telephone - PES placement officer
-  Mobile application
-  Internet Web page
-  Email
-  Telephone - Interactive voice response (IVR)

5.2.2. Sharing Information about vacancies

-  PES officer at PES offices
-  Telephone - PES placement officer
-  Telephone - Callcenter
-  Selfservice (displayed at PES offices)
-  Mobile application
-  Internet Web page
-  Internet kiosks at PES office
-  Internet through PES officer
-  Email



5.2.3. Supporting services

-  (Pre-)selection of suitable candidates and proposal to employer
-  Support for the relocation of applicant's families
-  Assistance in hiring job seekers from abroad
-  Computerized matching between job seeker/ vacancy











Traditional service







Digital service

5.3. Labor migration for national job seekers











5.3.1. Registration

-  PES office
-  Post
-  Telephone – Callcenter
-  Telephone - PES placement officer
-  Mobile application
-  Internet Web page
-  Email
-  Telephone - Interactive voice response (IVR)

5.3.4. Foreign vacancies information









-  In person training programs by PES
-  In person training programs by contractor
-  Online training programs by PES
-  Online training programs by contractor

5.3.2. Foreign vacancies information

-  PES officer at PES offices
-  Telephone - PES placement officer
-  Telephone – Callcenter
-  Selfservice (displayed at PES offices)
-  Post
-  Mobile application
-  Internet Web page
-  Internet kiosks at PES office
-  Internet through PES officer
-  Email



5.3.3. Supporting services

-  Personal at PES office*
-  Post
-  Telephone – Callcenter
-  Telephone - PES placement officer
-  Specialized placement agencies/providers
-  Online (Skype, chat)
-  Email
-  Web page (practical advices, cv writing)



Traditional service



Digital service

* Special border offices giving services to foreign job seekers who cross the border

5.4 Labor migration for foreign job seekers

5.4.1. Registration



PES office
Post
Telephone – Callcenter
Telephone - PES placement officer
Mobile application
Internet Web page
Email
Telephone - Interactive voice response (IVR)

5.4.2. National vacancies information



PES officer at PES offices
Telephone - PES placement officer
Telephone – Callcenter
Selfservice (displayed at PES offices)
Post
Mobile application
Internet Web page
Internet kiosks at PES office
Internet through PES officer
Email



5.3.3. Supporting services



Personal at PES office*
Post
Telephone – Callcenter
Telephone - PES placement officer
Specialized placement agencies/providers
Online (Skype, chat)
Email
Web page (practical advices, cv writing)



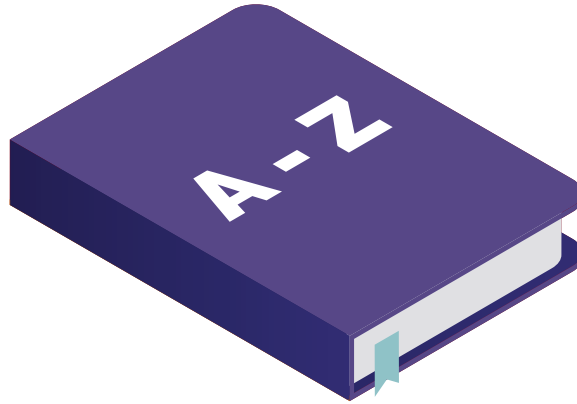
Traditional service



Digital service

* Special border offices giving services to foreign job seekers who cross the border

ANNEX 2. GLOSSARY



ARTIFICIAL INTELLIGENCE:

AI is the science and engineering of creating intelligent machines, especially intelligent computer programs. It is related to the task of using computers to understand human intelligence, but AI does not confine itself to biologically observable methods.

Source:

<http://jmc.stanford.edu/artificial-intelligence/what-is-ai/index.html>

BEST-OF-BREED

When companies buy software from different vendors to get the best alternative for each application area, they select the best-of-breed for each one. For example, companies might buy a human resources package from one vendor and an accounting package from another. Although enterprise resource planning (ERP) vendors offer numerous business applications and claim that their integrated systems are superior solutions, it is rare for all modules of an ERP system to be “best-of-breed.”

Source:

<https://www.gartner.com/en/information-technology/glossary>

CYBERSECURITY

This is the act of defending computers, servers, mobile devices, electronic systems, networks and data from malicious attacks. It is also known as IT security or electronic information security. The term is applied in a variety of contexts, from business to mobile computing.

Source:

<https://latam.kaspersky.com/resource-center/definitions/what-is-cyber-security>

DIGITAL TRANSFORMATION

This is the process of using digital technologies to create new business processes, culture and customer experiences. Digital transformation fundamentally changes the way an organization operates and delivers value to its customers. It also involves a cultural shift that requires companies to challenge the norm, experiment and become more comfortable with the possibility of failure.

Source:

<https://www.salesforce.com/eu/blog/2020/01/what-is-digital-transformation-a-quick-guide.html>

ECONOMIC TRANSITIONS

This term describes economic changes that lead to increased production of added value, which implies promoting diversified economic models and financial systems, as well as directing resources towards sustainable development.

Source:

<https://www.afd.fr/es/transicion-economica-y-financiera>

ENTERPRISE ARCHITECTURE

Enterprise architecture (EA) is a discipline that focuses on leading business responses to disruptive forces in the environment in a proactive, holistic manner. To do so, EA identifies and analyzes the activities required to realize the changes necessary to achieve an organization's vision and obtain the desired business outcomes. In other words, EA is "the definition and representation of a high-level view of the organization's business processes and its information technology systems, their interrelationship, and the degree to which the processes and systems are shared by different parts of the organization."

Source:

<https://www.gartner.com/en/information-technology/glossary/enterprise-architecture-ea>,

<https://www.opengroup.org/>

INTEROPERABILITY

It is understood as the ability of ICT systems to interconnect data and processes to share information and knowledge within the framework of protection, ethics and security in an agile, efficient and transparent manner, with the ultimate goal of making decisions based on facts.

Sources:

<https://publications.iadb.org/es/el-abc-de-la-interoperabilidad-de-los-servicios-sociales-marco-conceptual-y-metodologico>

LABOR INTERMEDIATION

This set of actions is aimed at putting workers seeking employment in contact with those offers available in the market that match their professional profiles.

Source:

<https://www.modelocurriculum.net/blog/que-es-la-intermediacion-laboral-y-como-puede-ayudarte-a-encontrar-trabajo>

PUBLIC EMPLOYMENT SERVICES

PESs are those through which many of the active labor market policies used to help workers find jobs and companies fill vacancies are planned and implemented. They also serve to facilitate labor market adjustments and to cushion the impact of economic transitions.

Source:

<https://publications.iadb.org/es/publicacion/17393/el-mundo-de-los-servicios-publicos-de-empleo>

TECHNOLOGICAL INFRASTRUCTURE

It comprises the components of the back-end IT systems (mainframe computers, servers and databases), as well as the space where they are housed. It also includes peripheral and network access equipment.

Source:

<https://www.gartner.com/en/information-technology/glossary>

