



BIT FRAMEWORK

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7th June, 2017



Introduction

Today, the global business and social environment is very competitive and constantly changing, information and communications technology has developed dramatically and new technologies have emerged, while businesses often find themselves unable to keep up. To survive and thrive, businesses must constantly find ways to innovate and differentiate themselves - to do things better, faster and cheaper, and to engage customers in new ways. The 'digital economy' not only constitutes a possible threat but also creates excellent expansion and growth opportunities for businesses capable of making the organizational changes to transform their business model, people management, customer relations and business processes.



BIT is a Digital Business Transformation Management Platform which offers state-of-the-art technology, software methodologies, enterprise applications, an open collaborative environment for further expansion and accessible business metrics to meet real-world business needs. BIT effectively helps businesses to thrive and excel in the digital business transformation journey.

Evolution of Business Software



IT has been an integral part of business operations since the early 60s. Four definable generations of business software exist, each of them driven by a significant technological development.

[1960 - 1980] Proprietary Solutions

Businesses purchase customized software from independent software vendors to cope with increasing financial data. IT infrastructure consists of proprietary and expensive hardware and software. IT cost is prohibitive for most businesses.

[1980 - 2000] Business Applications

Integrated general-purpose online business applications emerge, gaining a significant share of the business software market. Client-server architecture dominates. IT costs fall dramatically.

[2000 - present] Hybrid Software

Web, Cloud, mobile and IoT applications co-exist with legacy systems to cover the increasing needs of modern businesses, creating hybrid and unwieldy IT environments. IT costs stay relatively high due to technology complexity.

[future] Business Integrated Platforms

Business software is delivered in the form of integrated online software platforms providing powerful software technology infrastructure with low-code development, customization and interfacing capabilities. IT departments, IT Infrastructure and software may be located anywhere on the Cloud and costs are flexible.

BIT FRAMEWORK (Business – IT Framework)

The Business mix remains the same, but today businesses must think and act smarter, faster and more effectively. The rapidly-changing business environment makes conducting business effectively, almost impossible without powerful technology. BIT offers that technology to businesses in such a way that business methods and practices are integrated with software and applications.



BIT Framework manages

- the business processes vital to the mission of the enterprise
- the business data required to perform the processes
- the business applications required to handle the data
- the environment required to develop the applications
- and finally, the technology

infrastructure to support the enterprise architecture.

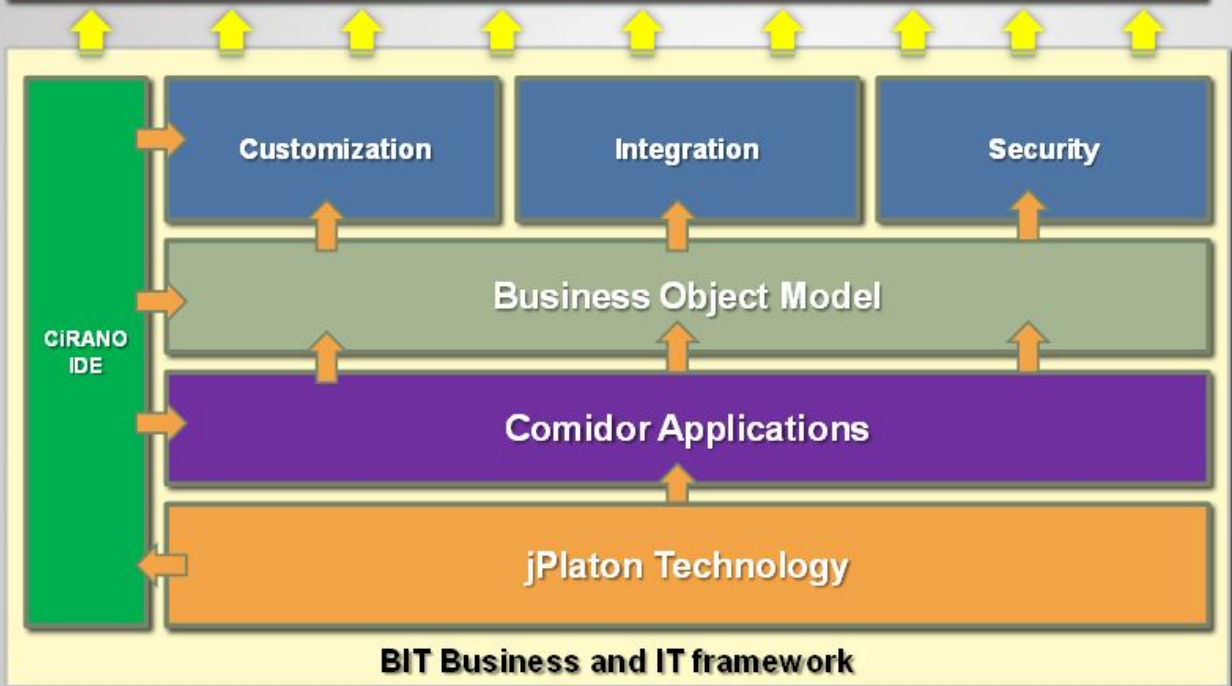
BIT bridges the gap between business and software technology.

BIT consists of seven layers, each of which has its own properties, characteristics and functions which separate it from the other layers.

1. Platform Layer
2. Development Layer
3. Application Layer
4. Business Layer
5. Integration Layer
6. Customization Layer
7. Security Layer

BIT – Business and IT Framework Architecture

VARIOUS ACCESSIBLE MARKETS ACROSS INDUSTRY SECTORS

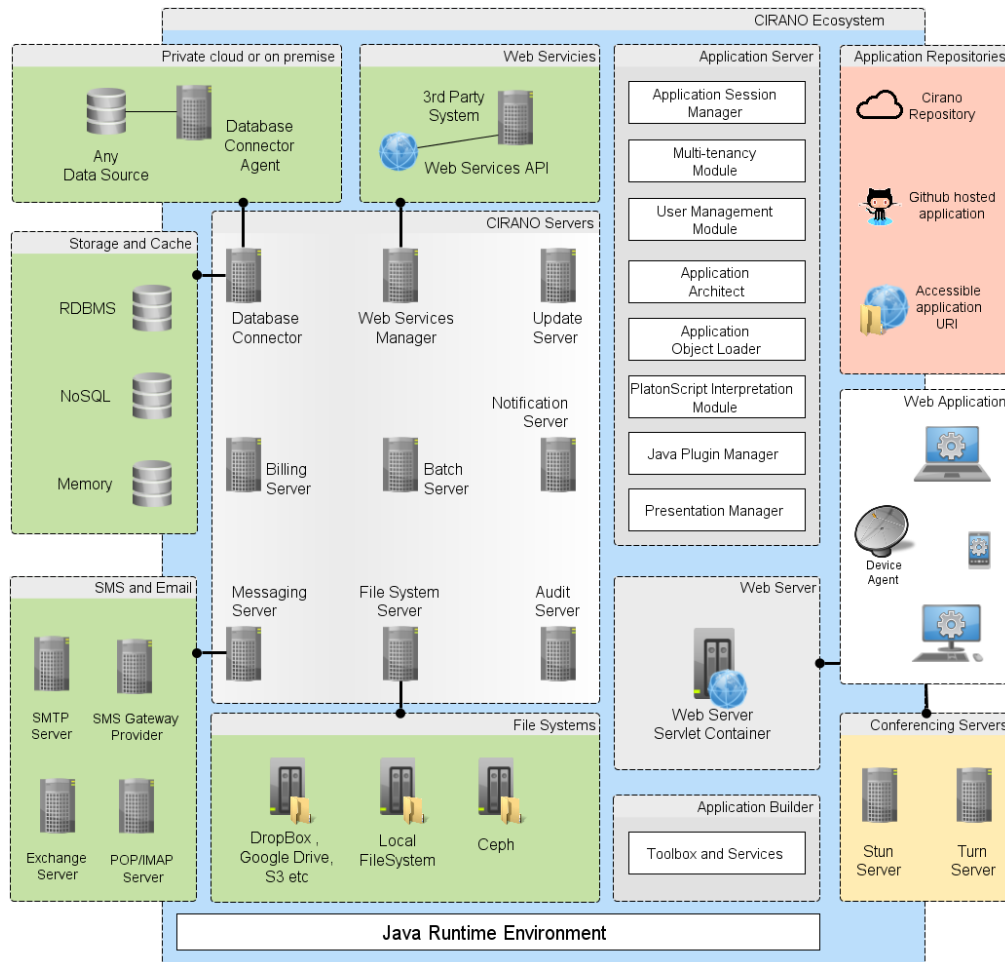


Platform Layer: jPlaton Technology

jPlaton technology is an integrated environment designed to develop and run multi-developer, multi-customer, multi-user, multi-session and multi-device open applications for the Cloud.

jPlaton Component	Description
Operating system	Windows platforms, Unix and Linux platforms
Web Server	Apache/Tomcat, WebLogic or any web server with Java servlet container
Database Server	Oracle, MySql, SQL Server, NoSQL database server
File Server	Storage and retrieval of files and documents from local and remote file systems
Cloud Application Server	Java Application server to serve the application logic
Utility Servers	Auditing server, Billing server, Messaging server, Batch server, Conference server
MVC Controller	Implemented in Java and XML technologies
Client technologies	Javascript, AJAX, jQuery and other Javascript libraries
Mobility	Mobile versions, Native mobile applications
IoT technologies	Wearables and IoT connectivity
Other libraries	Web RTC, Web sockets, Web services, REST, JSON, Libre-office connectivity, Apache libs, etc.
Application Architecture	Open, collaborative, distributed environment Multi-layer programming implemented with Cascading XML
PlatonScript	Full server-side and client-side scripting language to handle data, logic and presentation layers

jPlaton platform architecture



The jPlaton platform is composed of the following main tiers:

The **jPlaton Application Server** handles the requests from the Web server, creates the application environment as well as the user sessions, connects the application to the Database Server, allocates resources to user requests and assembles every program unit from the respective XML files. It also checks the owner rights of every action on the system and guarantees the secured operation of the system.

The Application Server is a complex structure that contains the following modules and subsystems:

- The Application Session Manager, which handles functionalities and data stored in the context of a session until it has expired.
- The Multi-tenancy module provides reusability of shared resources among users, for example database metadata, and is a necessity for cloud environments.
- The User Management Module creates user tenant environments, controlling the user's access to the application's resources and functionalities.
- The Application Architect collects Application Components from local or remote repositories, integrates them and then loads the output multi-layered Application.
- The Application Object Loader reads an Application's definitions and models, and creates objects needed on application runtime.
- The PlatonScript Interpretation Module performs script commands and offers the platform's API to develop the application's business logic.
- The Java Plugin Manager uses a set of platform plug-ins to extend platform functionality.
- The Presentation Manager generates user interfaces and user components for client devices.

The **jPlaton Database Server** connects the application to a database source even when not located on the Application server (e.g. on another Cloud). The Database Connector has been developed to make the platform database-agnostic and support several vendors' Database Management Systems. It supports Relational, NoSQL and Memory databases and uses pooling techniques for efficient resource management. Additionally, a Database Connector Agent can be installed on remote systems which can collect data from any data source and communicate with different software applications, legacy systems and custom-built programs. It can then transmit the data to a Database Connector, acting as a bridge between data providers.

The **jPlaton File Server** can use an off-database location for persisting the application files and is capable of storing and retrieving files from local file systems, distributed object stores and other third-party file system services.

The **jPlaton Integration Module** can create, offer and consume SOAP, REST and RPC web services to further enhance the platform's integration and communication capabilities with third party systems. These services are also used by Device Agents, which connect to different types of sensors and transmit their data to an Application, rendering the platform IoT-ready.

The **jPlaton MVC Module** transforms the XML data from the Application Server into working and operational objects and runs the application logic.

The **User tier** may be a PC with the jPlaton Client, or a browser or a mobile or any smart device that can be connected to the system via HTTP, Web services or TCP connection.

Also other servers are available in the jPlaton environment:

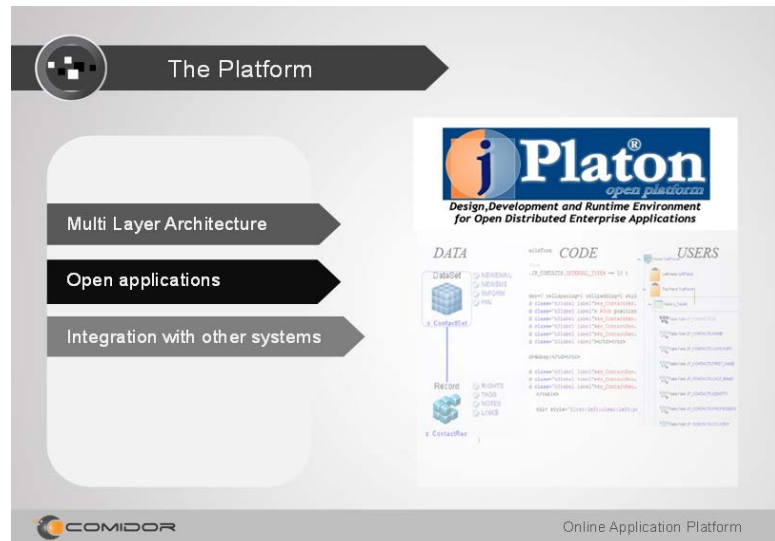
- Messenger Server handles system and user messages.
- Audit Server records all the system logs.
- Billing Server makes billing records for the customers which use payed services.
- Conference Server is used for chat and video conference.
- Web Services Manager handles used for handling web services.
- Batch Server handles predefined system actions.

jPlaton is a novel integrated framework based on Java and XML

jPlaton offers an integrated platform for software application development, independent of operating systems, data bases, system architectures and underlining technologies.

Any application built on jPlaton consists exclusively of plain XML files and can be installed on Windows, Linux


and Mac, can connect with Oracle, Mysql, Sql Server, etc, and may run on a rich thin jPlaton Client in a typical client-server multi-tiered installation or in a web-based environment within a browser.



jPlaton open multi-layered distributed architecture permits application growth and encourages collaborative software development. Any number of developers or developer teams can work on, upgrade, modify, extend and integrate the same software project.

A typical application built on jPlaton consists of small program parts (program units).

All the functionality of a program unit is contained in XML files that describe the objects and procedures of the unit. These XML files are well organized, constructing a multi-layered, homocentric environment.



Any layer may add new functionality or may change the functionality of the inner layers. The number and nature of the layers depends on the specific application.

At execution time, all the necessary information of a specific program unit is collected and assembled from all the locations where it may reside, taking into account the specific installation and user settings.


Thus, the jPlaton Application Server acts as a search engine on program functionality.

The final product may have many contributors, all of whom retain the rights to the code written.

jPlaton offers all the necessary tools in one platform that are needed to design, develop and run the application, isolating the developer from infrastructure technologies and user-execution environments, maximizing the productivity and providing an integrated, uniform, open and collaborative environment which allows the implementation and upgrade of large software projects by small development teams.

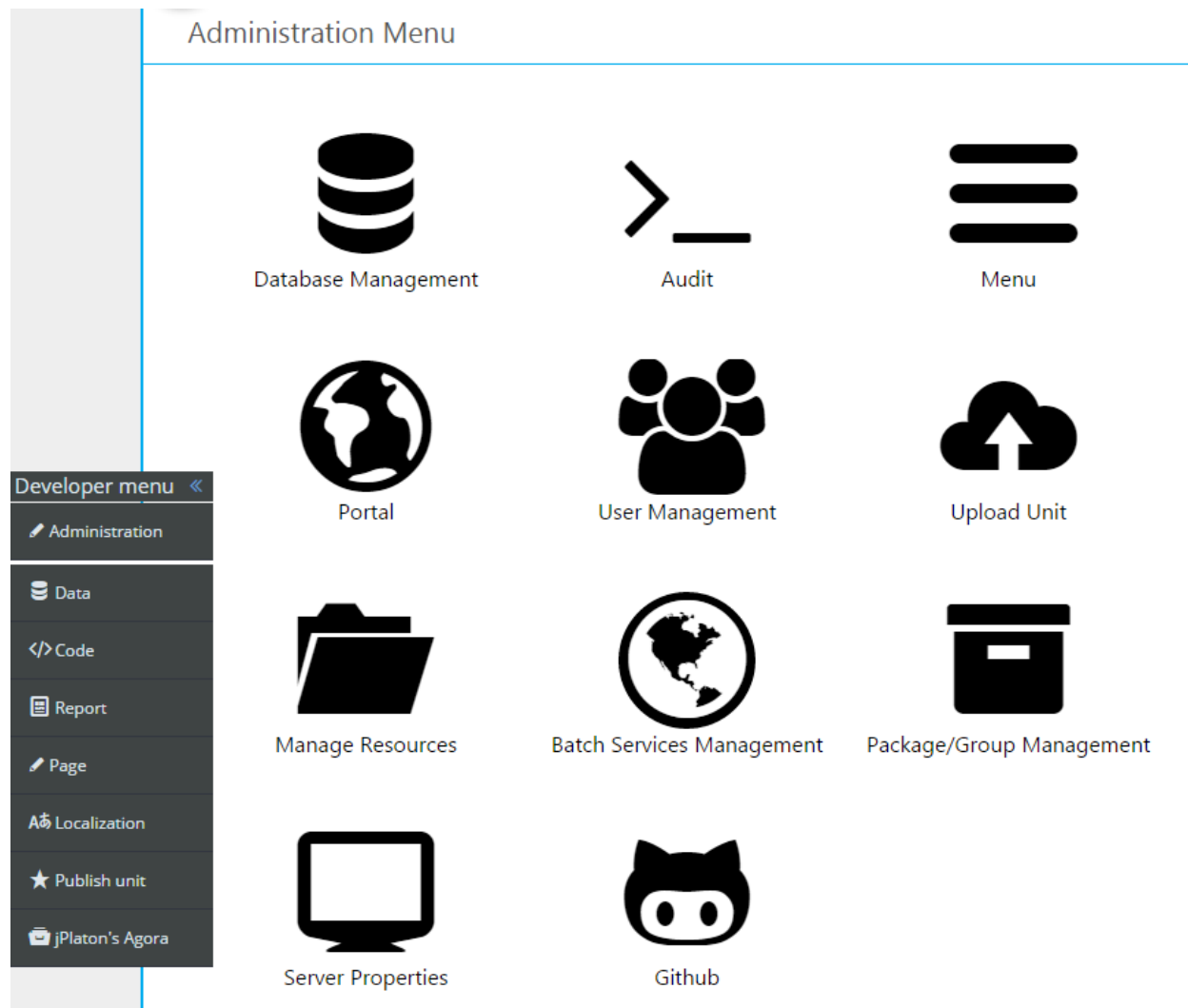
The completely open and transparent architecture (all in XML files – no binary) permits the flow of know-how among the layers, facilitating integration, while the distributed multi-layered architecture enables the evolution of the product, while at the same time preserving the simplicity and reliability of the inner (core) layers.

The jPlaton application uses no binaries, DLL, stored procedures, or other complicated and closed technologies, but only well-known open standards as XML, TCP/IP, SQL. Thus, the developer's job becomes easier and the developer themselves more productive.



Development Layer: CiRANO IDE

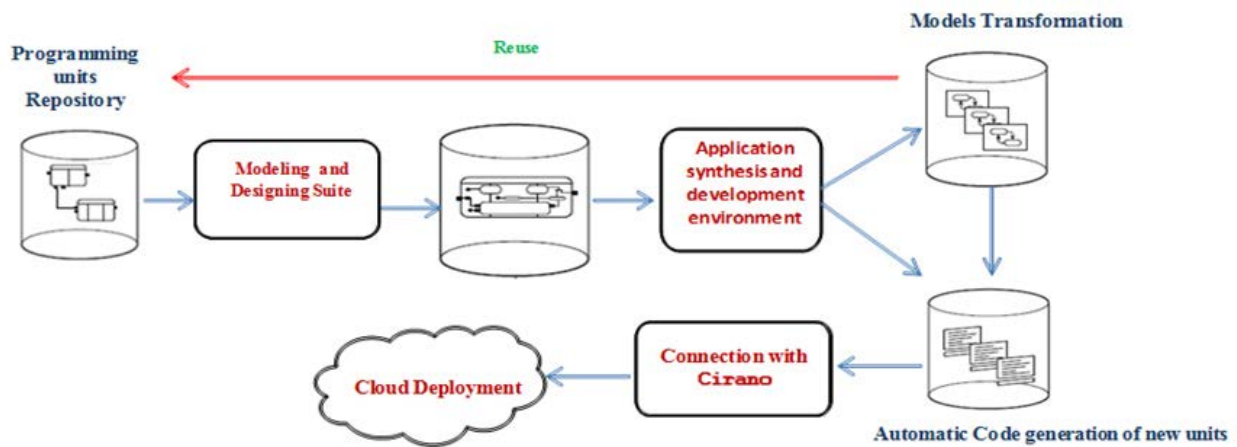
The CiRANO platform is a modular Integrated Development Environment (IDE) for cloud-based applications. The proposed platform is built to support Model Driven Development (MDD) and team collaboration in order to facilitate the rapid development of advanced applications in the cloud.



CiRANO is a modern aPaaS platform, which addresses some of the shortcomings of existing aPaaS platforms and programming environments without compromising basic characteristics like simplicity, potential for rapid development, flexibility and scalability.

More specifically, its model-based architecture makes the MVC (Model View Controller) pattern a standard programming procedure, whereas in other programming environments it is an optional feature. Thus, the first step of application development is the creation of data models using visualization tools without coding, which makes the code-data separation even clearer.

Furthermore, the platform introduces the concept of a “programming unit” in order to address the need for segmentation of large applications into smaller groups of features which can be developed simultaneously. A programming unit consists of data models, a code controller and view objects, while it can also inherit models or code from other programming units. In a conventional programming language, a programming unit could be a package which could contain classes or files. A set of programming units can be grouped to create layers of units, which are stored in a hierarchy in such a way that upper layers can interact with lower layers, inherit objects and also add functionality.



Functional Architecture

The CiRANO platform follows the Model-Driven Architecture (MDA), defining three types of models for the representation of the functional and non-functional behavior of the system (see Figure 2):

1. The Computational Independent Model (CIM), which is an abstract layer that describes the behavior of the application, without revealing any technical details.
2. The Platform Independent Model (PIM), which describes the system and its subsystems in a platform-independent way, keeping the system free from installation limitations.
3. The Platform Specific Model (PSM), which extends the PIM, showing the details required for the system's installation on a certain platform.

Each of the aforementioned layers includes a number of available components. More specifically, CIRANO CIM (CCIM) includes the code model, which consists of the representation of the application's business logic written in PlatonScript, the platform's custom programming script language. Code is based on events (database or user-based events), the data model (which represents the unit's data in a typical ER diagram), and the page model (which defines the necessary UI for the user's interaction with the data and the code model).

CPIM defines the real-time components that are dynamically created during runtime by the Application Server. These components include:

- Data objects: any kind of data collections which are required by the unit's specific functionalities.
- Filter objects: criteria and selectors which act on the data objects in order to filter their data.
- Code objects: procedures written in PlatonScript.
- User Interface Objects: graphical components (like tables, forms, fields, graphs) which are connected with the data objects and presented to the final user.
- Menu Objects: specify the user access to application units.

Finally, **CPSM** contains the platform-specific components used during CIRANO deployment. This includes the VMs or Docker containers, the OS-specific Java Runtime Environment, the appropriate Database instances and other servers that might be available. Examples of such servers are Email servers used to send and receive emails, Conference servers that enable real time communication, and Web servers that process HTTP requests.

CIRANO toolboxes and services

CIRANO platform offers the whole spectrum of cloud development services.

CIRANO Toolbox	Description
User Management	The administrator can create users and roles, assign roles to users and grant specific access permissions.
Database Designer	Developers can use the graphical interface to create their database (CREATE, ALTER, MODIFY, DELETE) and design their data tables by adding platform-specific table field attributes.
Auditing Tool	The auditing tool allows developers full access to their application's log file. They are able to distinguish between database errors or application errors and identify possible risks or user actions that might harm the application.
Menu Editor	The Menu Editor toolbox offers the developer the necessary tools to design, code, test, edit and build his application's menu.
Portal Designer	The developer can either choose a predefined theme and customize it, or create his own page, using text content editing tools (WYSISWYG editor).

Batch Services Manager	The Batch Services Manager provides a management tool to schedule repeated background tasks.
Messenger	The Messenger is a complete communication system which allows users to communicate with each other during the development process.
Device Agent	The platform offers integration with various third-party devices (hardware peripherals, smartphones, tablets, pebble watches and other hardware devices).
CIRANO Repository	The developer can log in the CIRANO jAgora repository and download model templates or complete applications and embed them or integrate them into his own application.
Repo Publisher	The developer can utilize the Repo Publisher tool in order to upload his application onto the CiRANO jAgora marketplace where it is available for distribution.
Unit-specific	
Data Model Designer	The Data Model Designer provides a user-friendly development environment for designing and creating new datasets, queries, lists, variants and data records. The developer can also precompile his design for debugging purposes, while an “auditing” process is available upon saving the designed XML for quality inspection purposes.
User Interface Designer	The User Interface Designer comes with a handful of design tools, such as forms, tables, panels, HTML areas, bars and more. Components can be added with drag ‘n drop and the developer can actually build the UI.
Code Editor	The Code Editor tool lets designers write the event-driven procedures in PlatonScript. They can also add Javascript or CSS files required by the client-side application part.

Report Designer	The Report Designer is a scripting tool optimized for report generation of data acquired via the Data Model.
Localization Manager	The Localization Manager provides an interface to manage text translations and utilize the platform's multilingual capabilities.

All tools are accessible from the Developer's menu. The first option (Administration) will open the global application tools. The subsequent options open the corresponding unit-specific tools, when a unit is open and selected.

Application Layer: Comidor Suite

Comidor application suite constitutes the Application layer.

Comidor is a cloud software suite for Enterprise Collaboration, People Management, Sales and Project Management and Workflow Automation which provides an efficient and affordable solution to businesses and organizations to enable them to succeed in digital business transformation. With Comidor, business users have the right tools to cope with any task assignment, project or process regardless of complexity or size, while managers can track leads, pursue opportunities, optimize marketing campaigns, secure project completion and optimize business processes.

Comidor works as a business infrastructure which handles and optimizes:

- ✓ Business Network (employees, partners, vendors, leads, customers, contacts)
Organizational Structure (divisions, departments, users, roles, access rights)
Internal/External Communication channels (e-mail, messages, chat, video call, alerts)
- ✓ Collaboration across departments (tasks, issues, topics, events, calendar, workflows)

- ✓ Knowledge Database (documents, portal, wikis)
- ✓ Workflow design, Process optimization and automation (Cases, Issues, etc)
- ✓ Planning, executing and monitoring Projects (projects, cost, deadlines, milestones)
- ✓ Sales force Automation (campaigns, leads, opportunities, web analytics, social media)
- ✓ Financial Overview and KPI's (income, expenses, budgeting)
- ✓ High-Level interconnection with legacy systems (integration via web services or direct access)
- ✓ Business Intelligence (reports, graphs, filters, query builder)

Comidor functionality is grouped together into five packages which cover basic and critical business needs:

EC - Enterprise Collaboration

PPM - People Management

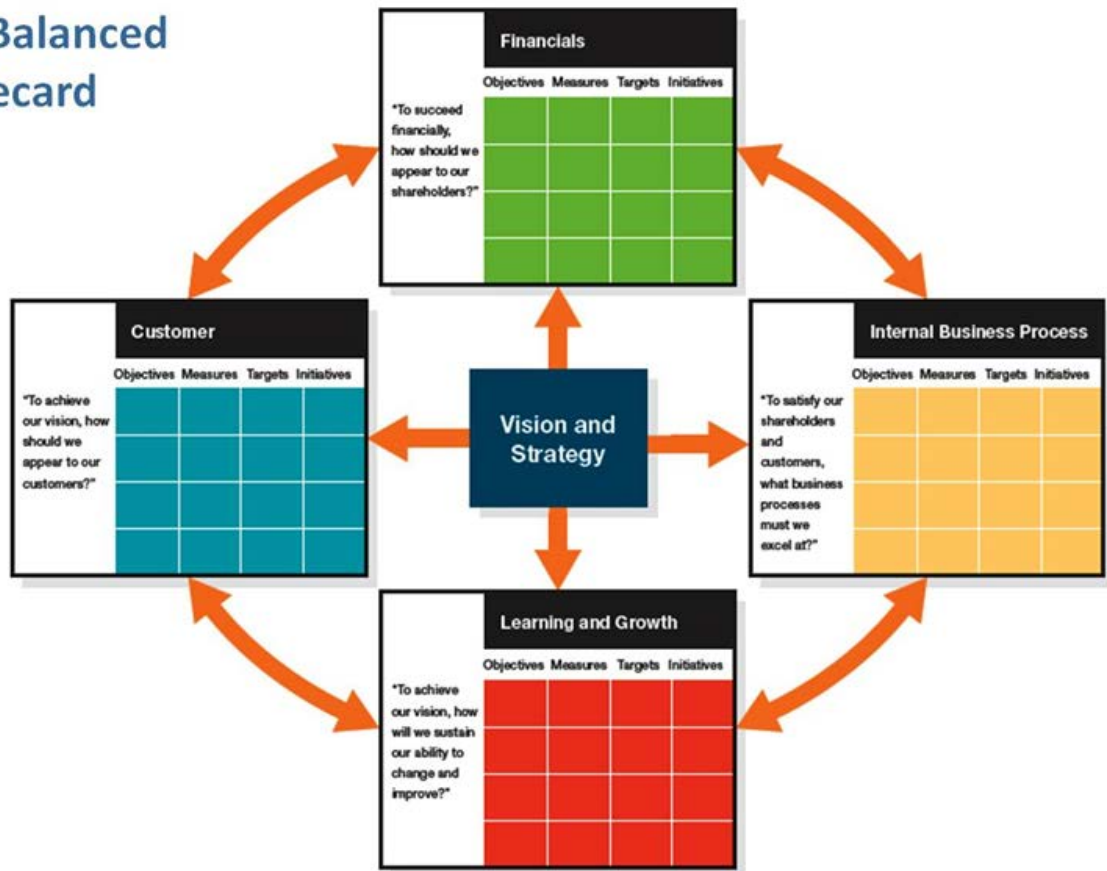
BPM - Business Process Management

PM - Project Management

SFA - Sales Force Automation

Comidor supports the business's combined and systematic effort to maximize the efficient use of resources such as staff, money, time and knowledge to produce goods and services for the market, and output measurable value according to the business vision and mission.

The Balanced Scorecard



Strategic Business Management with Comidor Balanced Scorecards

Balanced Scorecards (BSC) is a performance framework that adds strategic non-financial performance measures to traditional financial metrics to give managers and executives a more 'balanced' view of organizational performance. BSC is a management system (not only a measurement system) that provides feedback on both the internal business processes and external outcomes in order to improve strategic performance and results continuously.

The BSC suggests that we view the organization from four perspectives, and develop metrics, collect data and analyze it relative to each of them:

KNOWLEDGE: In the current climate of rapid technological change, it is becoming necessary for knowledge workers to be in a continuous learning mode. Metrics can be put into place to guide managers in focusing training funds where they can help

the most.

Comidor provides People Management solution with roles, skills and job management and a wealth of communication tools (email, chat, notifications, alerts, internal and external messaging, video call, topics, events) as well as knowledge database pools (wikis, documents) to cover this perspective, as well as a full record management system necessary to building an open and reactive business environment.

PROCESSES: This perspective refers to internal business processes. Metrics based on this perspective allow the managers to know how well their business is running, and whether its products and services conform to customer requirements (the mission).

Comidor has a process-centric architecture and includes plenty of process-related tools for abstract process definition and categorization, and allows the execution of any operation as a normal repetitive task or process, a case or issue, a complicated project, an opportunity, or even a marketing activity.

CUSTOMERS: If customers are not satisfied, they will eventually find other suppliers that will meet their needs. Poor performance from this perspective is thus a leading indicator of future decline, even though the current financial picture may look good.

Comidor provides a full CRM suite (Campaigns, Leads, Opportunities, Contracts, etc) with various handy tools (Contacts, Accounts, e-ticketing, social media, site analytics) and metrics for customer satisfaction, enabling the sales team to track leads, pursue opportunities and optimize the marketing strategy.

FINANCE: Timely and accurate funding data will always be a priority, and managers will do whatever necessary to provide it.

Comidor brings a solid FI ecosystem (Incomes, Expenses, Budgeting) along with a powerful integration module for integration with third-party Financial packages.

All four perspectives are wrapped-up around the heart of the organization (Vision, Mission, Strategy) where Comidor places the Organogram and the key players

(Personnel), providing as such a perfectly balanced business software.

Comidor suite offers a rich set of services and functions, as depicted below.

Application	Description
Enterprise Structure	Corporate structure, divisions, companies, locations, languages, time zones, currencies, organograms, departments, hierarchy, roles, job titles and more. Once the structure has been designed and built, it is used to reflect the real enterprise architecture and may be changed accordingly to business needs in order to serve the enterprise vision and mission.
People Management	People are the biggest asset any business has. Their performance can result in the success or failure of the business itself. Comidor provides tools to handle the hiring process, absence management, skill management, and personnel evaluation.
Enterprise Communication	The Comidor layer which allow the enterprise and guest users to communicate easily and effectively features modern technology and social tools and apps such as emailing, internal instant messaging, text chat or video-conferencing.
Enterprise Collaboration	Comidor offers multiple fully-interactive calendar views, advanced filtering, assignments, smart notifications, task repetition, and task automation, allowing users to work remotely using any connected device.
Enterprise Records	Comidor maintains records of any business actor or object who participates in business operations, offering full record functionality as create, update, tag, comment, rate, link and full search options.

Enterprise Content	Comidor Content Management contains all files, documents, images, books, best practices, and wikis used in business operations. Users are able to create, delete, update, upload, download, lock, share, tag, link and keep versions of any document or file. File system is stored on any private or public Cloud using any popular cloud file service. Topics and wikis are used to share knowledge to help business to grow, stay motivated and generate new ideas and finally achieve operational efficiency.
Business Processes	Business processes contains the abstract process definition and business categorization and allows execution of any operation as a normal repetitive task or process, a case or issue, a complicated project, an opportunity or even a marketing activity. Comidor supports all categories of business processes - primary, supporting and management processes - and all types of process execution practices - standard, dynamic, social, agile and workflow-defined.
Business Automation	Comidor Business Process Automation aims to improve the reliability and performance of business operations with Comidor Workflow Management. The system allows the user to design workflows easily and effectively no matter how complex, and to create the notification and alert system to ensure all relevant parties are promptly informed of any change. Also, Comidor enables task or process patterns and repetition scenarios to simulate processes.
Business Analytics	Comidor offers a wide range of predefined sales reports and analytics, which contain tools and ready-to-use reports and rich output to help business stay informed, combine related and unrelated data and take decisions based on

	business data.
Business Management	Business Administration allows the authorized user to modify the internal business parameters which affect business operations to make the system usable, secure, flexible and comprehensive. Comidor also provides the functionality to define and measure any performance indicator on the business process execution.
System Administration	The system allows the authorized user to modify the internal system parameters and security factors which affect system functionality and behavior, user settings and integration channels with other systems.

Comidor Units and Features

Enterprise Structure

The Corporate structure contains divisions, companies, languages, time zones, currencies, organograms, departments, people, hierarchies and roles organized to serve the enterprise vision and mission.

Globalization

Comidor is a global cloud solution offering a multi-currency and multi-time-zone environment where business may run using different languages, currencies and time-zones.

Account and Contact Management

Classify your Accounts (vendors, partners, reps, customers), maintain complete profiles (contact details, social media links, logos), define key-account managers and adjust access rights. Link your accounts with financial transactions, tasks, issues, opportunities, projects and even use Google Maps to run geo-location reports. Create custom filters to extract valuable reports and use the activity history to recall past activities or to stay updated. Import contacts from various sources.

Document Management

Create, delete, update, upload, download, lock, share, tag, link and keep versions of any document or file. Store the file system on any private or public Cloud using any popular cloud file service

Content & Knowledge Management

Maintain records with create, update, tag, comment and rate options, link records creating relations, effectively communicate ideas and use embedded wikis to share knowledge with your colleagues.

Multi-channel Communication

E-mail integration allows you to connect and manage any number of e-mail accounts. Connect with your colleagues with internal instant messaging, or using the friendly text-chat or the video-conferencing tool.

Enterprise Task Management

Comidor's fully-interactive calendar assists in monitoring tasks and assignments, offering multiple calendar views, advanced filtering, smart notifications, task repetition, task automation and more.

Timesheets & Workload Management

Tasks analysis support across Accounts, Processes, Projects and more. Personnel utilization and productiveness tools. Identification of over-utilized and less-utilized personnel.

Smart notifications & alerts

Create your own notification system to ensure you are promptly informed of any change. Create task or process patterns and repetition scenarios to simulate processes.

Personnel Management

Comidor provides tools to use, organize and maintain personnel records, assign personnel to departments and locations, define working conditions and measure personnel performance.

Leave & Absence Management

Define working days and hours per region or per individual. Minimize the administrative risks associated with personnel absences and prevent tasks and projects from failing due to poor control of personnel availability.

Job & Skill Management

Define all available job titles and the skills they require. Search people for desired skills, attributes and training. Assign roles to each user and link role with rights, responsibilities, activities and actions.

Recruitment and hiring

Identify vacancies, evaluate needs, develop and implement recruitment plan, review applicants, conduct interviews, and select, hire, and finalize recruitment using a flow-based multi-person process.

Role-based Access Control

Manage user access rights on different sections and units. Manage data view and change rights on data, creating a role-based access control mechanism.

Process Management

Manage your business processes effectively to expedite the handling of problems, claims, requests, proposals, services, maintenance, development, production or any other complex activity.

Advanced Case Management

Configure and track your workload accumulation at all times. Record and monitor the availability of personnel and equipment. Follow workflows to request, book or release any asset for a specific period.

Workflow Automation

Automate Business Processes and improve the reliability and performance of your business operations with Comidor Workflows. Design workflows easily and effectively, no matter how complex. Connect each workflow stage with actions and data using fully-customizable user data forms.

Business objectives & KPI's

Comidor has great tools and provides business owners and managers with the framework to define strategic goals according to company vision and mission statement, define business objectives for each goal, measure performance against goals and objectives, and improve and optimize decision-making.

Project Design & Gantt chart

With the Gantt chart designer tool, you can easily define the starting time and duration of any phase and scheduled task, set milestones and dependencies and draw the critical path.

Requirements & Deliverables

Exploit Gantt chart to define the list of requirements for each work schedule and assign them to multiple elements of your WBS. Set documents-deliverables for each phase and track delivery time.

Earned value management

Measure project performance and progress, track planned and actual costs. Calculate WIP using automated or semi-automated techniques and relate schedule, technical and cost performance with a uniform methodology and approach. Provide valid, timely and auditable information for proactive project management analysis.

Budgeting & Accounting

Project accounting helps you track all financial information that is involved

in any project stage, such as budgets, costs and expenses, billing and payments, providing full reporting and analytics.

Products & Services

List and categorize your Products and Services and maintain pricing lists. Create similar lists with competitive products/services and stay ahead of the competition. Your product catalog can be synced with your ERP or e-shop via web services.

Leads & Opportunity Management

Create complete profiles for your leads and closely monitor your potential deals, set targets and deadlines, assign and prioritize tasks, send proposals and analyze the competition.

Complete Sales Management

List and categorize your Products and Services and maintain pricing lists. Manage the complete sales process including quotation, proposal and contract management as well as ordering and billing.

Surveys and answers

Use surveys in Contacts or Accounts or Personnel and get valuable and

direct information analyzing the survey results.

Reports, Analytics & Graphs

Use Comidor functionality to get a wide range of predefined sales reports and analytics. Use the Pipeline Chart to compare won opportunities with lost opportunities. Check Sales Funnel to review the sales process. Enjoy full project reporting with data about people engaged, tasks, cost and time.

Configuration & Customization

Build an organizational chart to create a virtual map of your enterprise, define user hierarchy and roles, design workflows to simulate your

operations, set notification and alert mechanism.

Third-party Integration

Enjoy email and social media integration, file storage and document integration, task and contact integration, project management integration, external and hybrid database connectivity.

Low-code Development

Master the Low-code environment which offers System administration and utilities, Database schema design, Application unit modeling, cloud programming editor, Server scripting language, Report and Widget builder, Web services.

Business Layer: Comidor Business Object Model

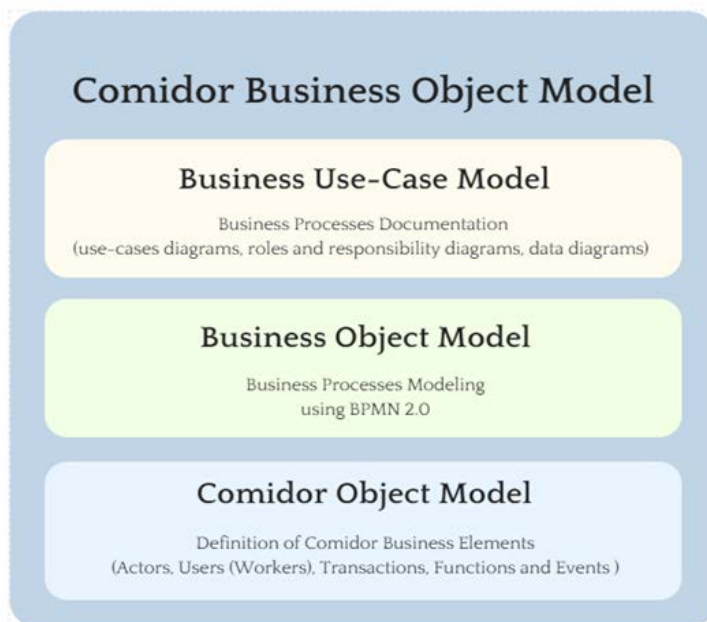
Businesses need to be more productive, efficient, automated and innovative. They need to be digitally transformed. A very good understanding of the business model and a working software model are vital to the success of the business digital transformation.

The Business Layer transforms Comidor abstract processes into real business processes. With the standard tools and methodologies, built-in business objects and functions and a powerful business process designer, any business may record, design, run and measure process efficiency and - most importantly - automate business process execution, thus improving reliability and performance.

Business process execution requires team/cross-functional collaboration and monitoring. People working within or across geographical or functional boundaries need to communicate and collaborate to synchronize their work. Management must monitor the business processes to ensure that the business work is executed correctly, and be able to identify possible improvements or realize the need for radical change if the specific method does not achieve the desired results.

This layer is developed on the Comidor Low-code Business Framework and orchestrates business processes execution.

These enhancements and automations can be measured using standard metrics highlighted by the Business Layer Framework. This Business process automation



engine can implement and orchestrate any primary or secondary process to add value through streamlining, standardization, reinforcing best-practices and supporting audit activities as well as corporate metrics and reporting. Comidor Business Layer uses BPMN2.0, the de facto standard visual modeling notation for the design of business processes, and extends it further to maximize the design potential.

Business analysts, designers or architects together with software or data analysts can use the designer to document complicated business processes. The design and implementation of the business operation is no longer about complex software methods and algorithms; the emphasis has shifted from technical issues to business value. A good business model provides a full, software-independent description of the business processes moving the focus to people, requirements, risks and business priorities.

The Comidor Business Object Model consists of the following parts:

- **Business use cases** describe business processes. The processes are documented as a sequence of actions that provide observable value to a business actor, using Use-cases diagrams, roles and responsibility diagrams, data diagrams and more in order to describe the processes in accurate detail.
- **Business object model** is the design phase of the process itself. With standard BPMN 2.0 notation and symbols, any process may be depicted and visualized as a sequence of actions and events with a conditional or unconditional flow.
- **Comidor Object Model** contains all definitions of Business Actors, Business Users (Workers), Business Transactions, Business Functions and Events which are used in normal process execution inside the Comidor low-code environment.

Comidor Object Model Definitions:

- Business Actors may be the Customers, Partners, Managers, the Company itself and any other entity involved in the business.
- Business Users are the Comidor internal or guest users participating in the business operations, in accordance with business process definition and design.
- Business Objects are secondary entities which represent services, records, information and content flowing through business sectors, during process execution.
- Business Transactions are designed to define interactions between Business actors.
- Business Functions enumerate common operations and utilities in business processes, such as sending or receiving an email, creating a new a task, creating a new account, etc.
- Business Events are related to events which occur randomly and usually trigger actions or alter normal process execution paths.



Comidor Business Object methodology includes:

- **Business Knowledge.** Get a deep insight into the business operation. Know the What, Who, How and Why behind any business function.
- **Process Analysis** includes Scope definition, objectives clarification, Cost vs Value diagrams and full documentation. Cost diagrams must contain all the scheduled or potential costs of the process (Workload, duration, risks and any other factor which may decrease the value of the process) while Benefit diagrams contain


everything (Value, Profit, Gain) which can add value to the process.

- **Process Modeling** includes Role and responsibility diagrams, Data diagrams, the design of the workflow of the process according to BPMN 2.0, the data modeling required, the user form design to engage users with process and data, and finally the programming code needed to accomplish the final process.
- **Process Execution.** Before normal process execution and monitoring, a set of KPI's must be defined to keep track of the process and measure the output, calculate results, and estimate outcome.
- **Process Improvement.** Depending on the results of step 4 - Execution, very often action must be taken to improve the process and ensure better results. Process improvements require minor or drastic changes to workflow design which may include one or all of the following: eliminating work with limited value, combining or rearranging steps, simplifying tasks, changing normal flow execution, or automating some tasks.
- **Iterative process change.** Business process management (BPM) is aimed at optimizing the efficiency of a business. The platform provides the methodology, valuable tools and best practices to orchestrate the full business process lifecycle with respect to the basic functional BPM principles.

Integration Layer: Comidor Connect

BIT technology provides a fully-integrated environment for its applications. There is no need to write extra code or implement add-on services in order to connect the modules and make them work together.


But interfacing with third-party systems, already functional in a business environment, is another matter. Typical businesses use a variety of software and services to conduct their operations and in the long run they spend time and money, accumulate knowledge and value, and fully or partially adapt to these services. So the integration with other subsystems inside or outside the organization is a vital issue for the continuous growth and development of the



business. BIT technology provides an interface layer capable of connecting with the world both inside and beyond business boundaries.

The strategy for software integration must provide a road map that describes the steps to be conducted as part of the implementation of integration software and integration services. This strategy should be flexible, and fulfill the requirements of any specific installation. Then an approach must be selected to reflect the integrated environment that the business will work in. BIT supports a wide range of built-in integration with popular software systems to allow fast delivery.

Database and File system connectivity. Platform connections to any relational or non-relational database to make direct calls to the remote database. The administrator may easily set up and administer any connection with any local or remote data source. The Database Connector has been developed to make the platform database-agnostic and support several vendors' Database Management Systems. It supports Relational, NoSQL and Memory databases and uses pooling techniques for efficient resource management. Additionally, a Database Connector Agent can be installed on remote systems and this allows the collection of data from any data source and communication with different software applications, legacy systems and custom-built programs. It can then transmit the data to a Database Connector, acting as a bridge between data providers. Even though most databases can handle file storing to some extent, the system administrator might prefer an off-database location for persisting the application files. For that reason, the File System Servers are capable of storing and retrieving files from local filesystems, distributed object stores and other third-party file system services, such as Amazon's S3, through the use of their Web API. One of the supported object stores is Ceph, an open-source distributed object store and file system designed for high performance, reliability and scalability. Some of the benefits of using a Ceph cluster include the horizontal IO scalability that can be achieved by simply adding more nodes to the cluster, the snapshot backup feature and a REST Service Gateway which provides interfaces compatible with Amazon S3 and OpenStack Swift.



Integration services.

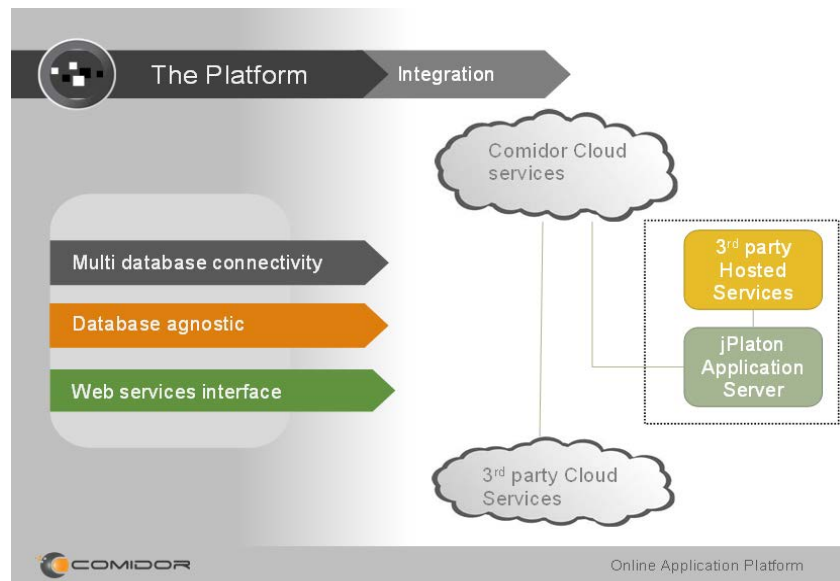
The platform aims to alleviate the overhead associated with development regarding common enterprise needs and activities by providing a toolbox of ready-to-use services.

More specifically,

Messaging Servers are responsible for intra-

application and external message exchanging through the use of Email Servers or SMS Gateways. The provided communication features can be used to send simple text messages or even to plan sophisticated real-time marketing campaigns. Notification Servers, employing Websockets technology, open a bidirectional channel offering real time communication capabilities between an Application and the connected users. In order to provide web-conferencing support, the aforementioned Notification servers are also used as WebRTC Signaling Servers.

The WebRTC APIs are designed to allow applications to create connections with Audio, Video, and/or Data channels directly between users via their browsers. Sometimes, due to network restrictions, e.g. firewalls, this direct peer-to-peer connection is not possible and a Turn Server is needed to forward traffic from one peer to another. Last but not least, the system administrator can use Batch Servers to schedule the execution of batch jobs at a specific time or at a specified interval.



Built-in integrations:

Application Category	Description
Integration with Cloud services	Integration with popular Public Cloud infrastructure services.
Database Connectivity	Integration with popular Database services.
E-mail integration	Definition of multiple email accounts, send, receive and synchronize with POP, IMAP and SMTP mail services.
Task & Event integration	Full synchronization with popular task Calendar and services.
Contact integration	On-demand import or export contact details with popular Contact lists.
Social media integration	Integration with popular Social media platforms and connection with Clients.
File integration	Integration with external Cloud file systems.
Project Mgmt integration	Easily import and export project Gantt charts and work schedules.
Integration with Collaboration systems	Communicate with popular collaboration tools for notes, tasks, assignments, posts and issues.
BPM integration	Import and export workflow patterns and designs, integrate systems during workflow management.
Accounting integration	Integration with Internal Accounting for invoices, payments, purchases and more
Integration with online	Integration with online payment systems.

payment systems	
External Data sources integration	Integration with external relational and No SQL data bases and data resources on the same or a different Cloud.
Cloud migration	Cloud migration generally involves moving data or other business elements between cloud environments, which is known as cloud-to-cloud migration. The process of transitioning to a different Cloud is known as cloud service migration. In any case, successful migration to a service provider's environment may require the use of middleware, such as a cloud integration tool, to bridge any gaps between the vendor's and the customer's (or other vendor's) technologies.

Application/Service	Description
Amazon Web Services	Integration with Amazon Web Services.
Oracle Cloud	Integration with Oracle Cloud.
MySQL	Integration with MYSQL Database.
ORACLE DB	Integration with ORACLE Database.
SQL SERVER	Integration with SQL SERVER Database.
MONGO DB	Integration with MONGO DB Database.
MS Exchange Server	Full synchronization with MS Exchange server.
Gmail	Full synchronization with Gmail server.
SharePoint	Full integration with SharePoint for Calendar, events,

	Contacts and more.
Dropbox	Integration with Dropbox service.
Box	Integration with Box service.
Google Drive	Full integration with Google Drive.
LibreOffice	Full integration with Libre-Office
Slack	Integration with Slack tasks and notes.
Redmine	Integration with Redmine Project Management.
Spark	Integration with Spark
Jira	Integration with Jira issue Management.

Customization and Implementation Layer

Making any software platform work for a business is not an easy task. It requires highly-flexible technology, smart design, incremental and iterative methodologies, and people with knowledge and experience. Comidor provides a certain set of tools and methodologies to make Comidor a perfect fit with any business of any size in any field.

Business structure and organogram. Set up the corporate structure and organizational chart of each entity, add users, assign them to groups and define hierarchy. Business structure may include all or some of the following layers:

- Corporate layer
- Division layer
- Company layer
- Location layer
- Group and Personnel layer

Business process categories and templates. Categorize business processes to reflect the business processes across all departments and functions. Standard categorization may be applied and changed depending on the specific business needs. The proposed business processes are categorized as follows according to business operations:

1. **MANAGEMENT**
 - 1.1. Vision and Strategy
 - 1.2. Business Planning
 - 1.3. Business Financing
 - 1.4. Corporate Governance
 - 1.5. Performance Evaluation

2. **PRODUCTS AND SERVICES**
 - 2.1. Research and Development
 - 2.2. Product Design
 - 2.3. Product Development
 - 2.4. Product Testing
 - 2.5. Product Maintenance
 - 2.6. Customer services
 - 2.7. Quality control

3. **SALES AND MARKETING**
 - 3.1. Market analysis
 - 3.2. Branding
 - 3.3. Product Marketing
 - 3.4. Relationships Management
 - 3.5. Sales forecasting
 - 3.6. Advertising
 - 3.7. Web marketing
 - 3.8. Lead management
 - 3.9. Opportunity management
 - 3.10. Account management

- 3.12. Contract management
- 3.13. Order processing
- 3.14. Billing
- 3.15. Customer support

4. **SUPPLY CHAIN MANAGEMENT**

- 4.1. Purchases and procurements
- 4.2. Warehouse management
- 4.3. Transportation and logistics
- 4.4. Manufacturing

5. **HUMAN RESOURCES MANAGEMENT**

- 5.1. Recruiting and hiring
- 5.2. Retirement and firing
- 5.3. Education and training
- 5.4. Leaves and Absences
- 5.5. Payroll and compensation
- 5.6. Benefits administration
- 5.7. Performance evaluation

6. **KNOWLEDGE MANAGEMENT**

- 6.1. Content management
- 6.2. Information sharing
- 6.3. Communication management
- 6.4. Education and training
- 6.5. Best practices
- 6.6. Forms and surveys
- 6.7. Management of change

7. **ACCOUNTING AND FINANCE**

- 7.1. Account Receivables
- 7.2. Account Payables
- 7.3. Cash flow management

- 7.4. Budgeting
- 7.5. General Accounting
- 7.6. Auditing and compliance

- 8. **SUPPORTING PROCESSES**
 - 8.1. Administrative support
 - 8.2. Infrastructure management
 - 8.3. Facilities management
 - 8.4. IT Management
 - 8.5. Outsourcing
 - 8.6. Security Management
 - 8.7. Risk management

- 9. **COMPLIANCE MANAGEMENT**
 - 9.1. Legal management
 - 9.2. Tax management
 - 9.3. Regulatory management
 - 9.4. Environment management
 - 9.5. Health management
 - 9.6. Safety management

Business processes are also categorized according to process execution type and methodology and the Comidor tools used to assist users to complete the processes:

- Generic processes
- Projects (Projects, Work Packages, etc.)
- Sales and Marketing processes (Opportunities, Campaigns, etc.)
- Social processes (Events, Topics, Surveys, etc.)
- Issues (Tickets, Support, etc.)

Lookup Data. Define and encode all the key-value data used in the business operations. These data are categorized according to the modification authorization level, and include lists for:

- Countries and Towns
- Languages
- Currencies and exchange rates
- Account and Contact categories
- Task and Job types
- Product and Services categories

KPIs and scorecards. Set up objectives and goals to measure business performance. KPIs are categorized into the four main business perspectives:

- Learning and Growth
- Internal Business processes
- Customer Experience
- Financial perspective

A KPI may be a Corporate indicator, a group indicator which is applied to a specific group, or a user indicator.

Best Practices. Store best practices for each process pattern to enable users to choose the correct path and avoid common mistakes.

Role-based access control and rights

Rights are granted to user roles. Any user role may have a company-wide, division-wide or corporate-wide perspective. Any user may have one or more roles, and through these roles can gain access **to applications**, which means what applications and programs units may execute; **to data**, which means which information is available for view or change; and finally, **to actions**, which means which actions are available for execution.

The predefined user roles for Comidor are:

Application-wide

- **System Administrator.** The user responsible for Comidor administrative tasks.
- **Data Administrator.** The user responsible for data administration and maintenance.
- **Developer.** The user able to modify the program unit.

Process-wide

- **System or Project administrator (2).** The users able to administer and manage the process.
- **Supervisor.** The user with authorization to oversee the process flow.

Account-wide

- **Account administrator (2).** The users responsible for Account administration.

Record-wide

There are access rights to view or change to each of the records that are maintained in the Comidor environment.

System Administration

System administration is absolutely critical, having a great impact on the overall Comidor functionality and performance. System administration tasks can be grouped into:

- **System installation**
- **System setup**
- **System monitoring**

- **User Management**
- **System auditing**
- **System Documentation**

Multi-layer development

Comidor installation development groups extend standard Comidor functionalities to adapt to the specific needs of a business, preserving the overall system integrity and stability. Comidor methodology efficiently faces the problem of 'upgrading', a common problem in complicated systems, where new features applied in a working environment occasionally cause problems with working units. Thus, the group or customer developer develops in a newly created environment - the developer sandbox - isolated from the previous core infrastructure, forming a multi-layered programming environment allowing them to extend functionality, create unique features and minimizing integration problems.

Business features to be implemented are organized in a tree-structure form, where groups inside the company are articulated in a chained-form. For each group of functionalities, a developer may be assigned. Development groups may be the same as the real business departments.


How does it work?

Every application in jPlaton consists of small program parts (program units).

All the functionality of a program unit is contained in XML files that completely describe the definition, properties, behavior and relations of these objects.

These XML files are well-organized in a multi-layered, homocentric environment.

Any layer may add new functionality or may change the functionality of the inner layers. The number and nature of the layers depends of the specific application.



At execution time, all the necessary information of a specific program unit is collected and assembled from all the locations where it may reside, taking into account the specific installation and user settings.


The objects that constitute a program unit are:

- **Database Objects**
- **Resource Objects**
- **Data Components**
- **Filtering Components**
- **Procedures**
- **User Components**
- **Menus**
- **Report Objects**
- **Document Objects**
- **Localization Objects**

There are three levels of unit implementation depending on tools used.

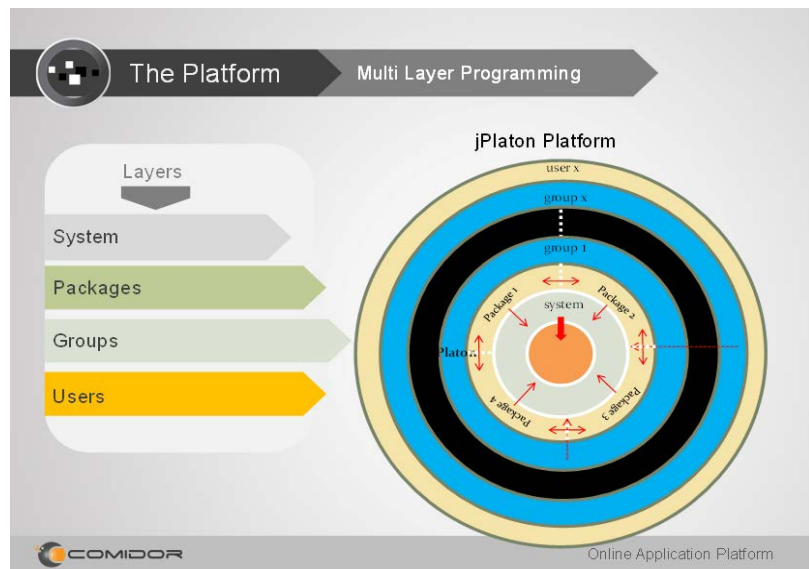
- **Design level** implemented with Graphical Tools (Unit Modelling Tools)
- **Logic level** implemented with PlatonScript (Simple Java-like Script Language)
- **Extension level** implemented with Javascript or other Client libraries

There are many layers of implementation according to the distributed–collaborative architecture, grouped in five main phases.



The **platform phase** consists of the jPlaton layer (main core layer) that has all the generic platform functionality.

The **core phase** consists of the system layer (main application layer) has the basic application functionality.



The **product phase** consists of the various packages:

package - 1 (application - 1 layer) functionality of package - 1

....

package - n (application - n layer) functionality of package - n

The **installation phase** consists of several group layers (depending on the complexity of installation or the grouping scenarios of installation types) that contain the functionality of a specific installation or installation type. The various group layers are organized in a tree structure.

main group

 subgroup - 1

 subgroup - 11

 subgroup - 2

.....

The **user phase** consists of the user layer that has specific user settings.

All the functionality of the application is loaded in a specific order (from inner layers to outer).

The layer is not a closed module (as in modular programming) but may change every inner layer (according to authorization and security rules) and may be changed by the outer layers.

The screenshot displays the 'The Platform' interface with an 'Open' layer. On the left, four horizontal bars represent layer characteristics: 'No binaries!', 'Easy updates', 'Customer satisfaction', and 'Simplicity and sustainability'. On the right, an XML code editor shows the structure of the 'Open' layer, including elements like `<?xml?>`, `<!--COMIDOR-->`, `<!--CONVERTLEAD:Convert_Lead.CREATEACCOUNT.CREATE_ACCOUNT_HOMEROLL:New-->`, `<!--CONTACTLEAD-->`, `<!--IDVIA-->`, `<!--MAILEXISTE-->`, and `<!--CONTACTDELETE-->`. The Comidor logo and 'Online Application Platform' text are visible at the bottom.

In contrast to classical OOP (that is not so easy to implement) the program structure remains simple, reliable and under control. Open (XML) structure reinforces the collaboration of various developers involved in a layer's development and makes the co-existence and co-operation of the layers possible.

Every layer has a signature that contains the developer identification of the layer, thus protecting the rights of every developer that contributes to the whole product and maintaining a secured environment. Every XML file is also signed to prevent abnormal modification by unauthorized developers. The behavior of the system in case of access or rule violations depends on the security level attached to the installation.

Security Management: Comidor Safe

Comidor offers unprecedented functionality due to its extendibility and build-in interoperability, but above all, Comidor is built with security in mind from design to deployment. In the following sections, we will present the specific measures which were taken to make Comidor a secure business management service.

Network Protection management Comidor is accessed through a firewalled network configured to reject any illegitimate connections except those allowed by the network administrator (default deny). Firewall configuration and management policy includes the following principles/practices:

- The firewall is configured with maximum security to ensure the protection of the network against malicious acts and accepts only pre-identified protocols and IP addresses.
- Physical and logical access to the firewall is restricted to authorized persons only.
- Backup management.
- Successful and unsuccessful attempts to pass through the firewall are recorded and monitored.
- Web servers have a local firewall activated on the servers' operating system restricting access only to specific ports and thus maximizing safety and tolerability against network attacks.

Database protection management Controlled access to the local Database (DB) is achieved through:

- Controlling users' access rights.
- Excluding access to local DB remotely.
- Ensuring that access is only possible through predefined administrators' IP addresses All changes/updates made at the platform level to the platform and application systems are recorded in Apache Subversion Software(SVN).

This method offers the following advantages:

- Easy to install new changes. Introduce, upgrade, delete files on a transaction.
- No lock files.
- Ability to retrieve older versions in real time during the procedure commit.
- Features branching and tagging and joining together.
- Maintain log files for and easily access and manage each change made.

Backup management The Comidor backup process ensures maximum safety and recovery of your precious application data. The backup manager applies the same high-level security policies and makes backups automatically and at regular intervals to minimize data loss in case of error or natural disaster. The manager makes a full back up every day and an incremental backup every four hours. Shortly after each full backup, the backup manager runs the compression and encryption process (application 7zip encryption AES256) on all backups of the day.

Audit Our hosting partner is Amazon. Amazon AWS certified on multiple SAS70 Type II audits under both SSAE 16 and ISAE 3402 professional standards. AWS is also certified under the ISO 27001 standard.

Authentication-Authorization First and foremost, all access to Comidor is permitted only over Secure Sockets Layer (SSL) connections. This way, users are assured that all information passed between Comidor and their browser is secure. For authenticating/authorizing users' access, Comidor follows a simple yet strict process in which users provide the given valid credentials (e-mail, password and company code) through SSL data transfer.

State-of-the-art practices for authentication/authorization are implemented:

- Prevention of unauthorized account/anonymous access.
- Account lockout.
- Valid (e-mail)/strong password enforcement. Account monitoring anonymous access to the system is permitted.

Additionally, the following policies are enforced:

- Users are initially supplied with a temporary password, and are prompted to change it immediately to their personal (permanent) one.
- Credentials are provided to users in a secure manner.
- Credentials are not stored in an unprotected format.
- Any non-SSL connection attempt is denied.
- All sessions are cryptographically protected and protected against hacking.

Updates management Comidor updates are treated as follows:

- **Critical/Important:** Corrective updates related to new vulnerabilities from malicious users or software are deployed directly without disrupting the normal operation of Comidor users.
- **Functional Updates:** Scheduled updates of Comidor functionality that are deployed and published in each Comidor release.
- **Bug-Fixes:** Corrective updates related to identified/reported bugs are deployed directly without disrupting the normal operation of Comidor users. Security and functionality updates deployed on the allocated servers (Web servers & database servers) are scheduled and managed based on their importance.

Epilogue: BIT Platform as a Business-Changer

Software platforms are ecosystems where products and services can be developed tied to a core technology and standard methodology. Software platforms have improved productivity, are characterized by increased innovation and are powerful engines for business change because of the built-in software and business functions they provide. Platforms offer the transparency and real-time insights into the relationships, processes and interactions among ecosystem actors to drive continuous improvement, enhance efficiency and maximize outcome.

Evaluation of a software platform is an important decision for CTO's and CIO's. A platform needs to fulfill basic requirements:

1. Is the Platform capable of facilitating IT and business collaboration?

BIT Platform provide the ecosystem to effectively manage:
the business processes vital to the mission of the enterprise
the business data required to perform the processes
the business applications required to handle the data

2. Does the Platform provide an environment where new applications can be developed?

BIT Platform provides the CiRANO IDE, which is a modular Integrated Development Environment (IDE) for cloud-based applications and supports Model Driven Development (MDD) and team collaboration in order to facilitate the rapid development of advanced applications in the Cloud.

3. Does the Platform provide an environment where updates and upgrades of existing applications can be developed ensuring the integrity and continuity?

BIT development groups extend standard Comidor functionalities to adapt to the specific needs of a business, preserving the overall system integrity and stability.

4. How easy is it to build new applications? Can any non-developer participate in the development process?

Low-code development of the BIT platform is moving the focus to the business needs and goals, enabling more rapid, iterative and collaborative development, offering the business agility, productivity, effortless integration, faster deployments, business orientation, effective lifecycle management and finally better ROI.

5. Is the Platform capable to delivering multi-device applications without extra effort?

Applications built on the BIT Technology are device-independent applications. Furthermore, BIT provides the technology for IoT support.

6. Does the Platform provide a fast, secure and flexible deployment mechanism?

BIT technology provides the multi-layer architecture to isolate the different phases of an application. Thus installing or updating the overall application is much easier and safer than conventional hierarchical or modular architectures.

