Very often new tasks cannot be solved within the framework of one core information system. At the same time implementation of different systems aimed at automation of separate business processes leads to additional expenses and delays. That’s why one of the relevant tasks of IT development is integration of disparate applications in the framework of one business logic to deliver the overarching functionality. In order to solve this task, CMA Small Systems AB has developed a product — PIE integration platform.

PIE® (Processware Integration Environment) is a set of programs for business applications integration. It provides timely, complete, and easy modifiable support for business processes thus enabling efficient automation of business processes through IT.

PIE is using Service-Oriented Architecture principles for the integration of program applications, presented as services. Integration in PIE is done through PIE’s ESB (Enterprise Service Bus) that provides a robust, dependable, secure and scalable communication infrastructure between services.

**PIE features**

External applications are presented as sets of services. Services are regarded to as business-functions with hidden implementation details.

**Description of a service interface as a set of incoming and outgoing messages.** Each interface of the integrated application defines a group of operations. The operations, in their turn, are defined by corresponding messages. The transformation of messages into operations and vice-versa is done by internal ESB adaptors – program components that work in the same context with other PIE server components.

Message schemes define the data formats for exchange. The formats are described with the help of schemes that are independent of HW & SW platforms and programming languages.

**Support for synchronous and asynchronous communication.** PIE communicates with external applications by means of ESB — a program infrastructure for external applications interaction, routing, format transformation, guaranteed message delivery, of data transmission security etc.

**Loose coupling**

The term “loosely-coupled interaction” means the reduction of assumptions and obligations, undertaken by the parties in the process of information interchange. It improves robustness, makes systems more resilient to changes, and promotes reuse of services.

**Service registry**

For the purpose of simplification and automation searching for the appropriate services PIE uses a metadata-warehouse, which contains descriptions of the application message formats and the procedures for interaction of the executable application tasks, which includes descriptions of all characteristics of the services used for creation of the integration applications.

**Quality of service.** Services usually have associated quality-of-service attributes, such as security, reliable messaging, transaction and message correlation support etc. These mechanisms are supported by PIE ESB and are realized by means of various adapters and components.

**Composition of services into business-process.** For composition PIE uses a graphical tool that describes business-processes on the basis of services. For this purpose PIE uses UML (Unified Modeling Language) activity diagrams. The interaction of services is presented with the help of a graphic editor. PIE uses integration adapters for presenting an application as a service and connecting it to ESB.
Adding applications into the integration environment

For integration of a new application, it is enough to design the necessary adapter and change the description of business-processes that are kept in the repository. The same refers to the replacement of one application by another (a new version or a migration to a program of another vendor).

Basic version of PIE includes a number of built-in adapters for connectivity/exchange via:

- Files: local file system, FTP, SFTP
- SQL tables: ODBC to most databases, native interface to Oracle
- ActiveMQ
- SOAP web services over HTTP/HTTPS
- XOWAL: CMA’s TCP/IP based protocol
- CORBA

Basic version of PIE also includes an external adapter (XAdapter) that supports the following additional modules:

- ODBC
- OLE DB
- MAPI/MS Exchange;
- WebSphereMQ(MQSeries);
- MS MQ;
- Extended file adapter.

There is a possibility to order a specialized adapter with an interface to a specific application according to customer needs.

Some of the specialized adapters widely used in different countries include:

- SWIFT (AFT, CASmf, MQSA, SAA)
- Oracle FLEXCUBE core banking
- Temenos T24 core banking

There are a lot of adapters to specific in-house systems of central banks or commercial banks.

Overall, CMA has almost a hundred of different adapters for communication with various applications, technologies and protocols.

If an application uses open standards of system interaction (such as XML), integration with PIE becomes easier.

The applications interaction logic changes in line with the change of business tasks. If it is necessary for some reason to modify the data flows in the corporate system or the algorithm of business applications interaction, it will be enough to change the business logic description in the visual environment. These changes do not affect the applications themselves and can be done fast enough.

Business processes modeling. PIE allows simultaneous change of the business logic; it also allows modeling of various methods of program applications integration into a unified environment. This allows estimating the efficiency of one or another business logic model and hence it helps to reveal the bottlenecks of the information system.

Thus, PIE offers a number of important opportunities for creation of a secure and manageable information infrastructures in accordance with the most actual market and legislation requirements.

Multiplatform

PIE is a multiplatform product, currently available and used on the following platforms:

- Windows x86
- Linux x86
- HP-UX Itanium2
- Solaris SPARC
- Solaris x86

PIE is available both as 32-bit and 64-bit application on all the platforms listed above, with the exception of Itanium2: PIE is only supported as 64 bit application on this platform.

List of supported platforms is based on customers’ demand. Therefore new platforms (such as AIX or Linux on non-x86 platforms) may be added in future.

Depending on customer needs, PIE is used either as a standalone product (enterprise integration solution) or as a part of CMA’s turn-key solutions such as DEPO/X, RTS/X, and BCS/X.