The English translation of the Polish brochure

V**XTEN** technology guide

This guide have been created for partners and companies cooperating with TENVIRK Sp. z o.o. The guide contains basic information about authorial V**XTEN** technology used to implementation of TENVIRK application.

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about TENVIRK

TENVIRK Sp. z o.o. is independent software developer. The company specializes in creating business applications using the newest internet technologies. TENVIRK is present on the market since 2002. Since 2006 TENVIRK works as a capital company.

TENVIRK produces and implements specialized CRM / ERP systems, addressed to service, commercial and educational sectors. These systems are created on the basis of authorial developer platform called "V**XTEN**". The software has very wide functionality, which, thanks to graphic tools, can be flexibly built or adjusted to specific solutions. The applications are created with a view to work ergonomics and efficiency meeting requirements of small and medium companies. This technology is also prepared for service of big companies, in particular multi-branch companies.

TENVIRK ensures a high level of service offering its clients special help and trainings programs based on internet service center worked out on V**XTEN** platform.

TENVIRK application offer includes three big systems:

- **TenvirkMK** - processes and documents management and communication organization.
- **TenvirkERP** - sales, warehouse management and company management.
- **TenvirkCM** - management system for schools and companies conducting courses and trainings.

Thanks to applying advanced technology based on multi-layered **SOA** architecture, TENVRIK software distinguishes itself with very favorable ratio of functionality and quality to price. V**XTEN** platform, in which TENVIRK applications are created, intensively uses WebServices technology, and **XML language is its "bloodstream"**. The possibility of applying any online and offline work scenario enables using TENVIRK applications in companies having dispersed organizational structure with many branches.

TENVIRK software, thanks to its technical innovativeness, have been several times honored among others in "Application of the Year 2005" and "**Application of the Year 2006**" competitions organized by Microsoft company.

TENVIRK
IT SOLUTIONS

V**XTEN** technology

V**XTEN** is a technology worked out by TENVIRK, developing scope of building business applications on Microsoft .NET platform. TENVIRK uses V**XTEN** application engine for building all its systems.

Creating business software from basics is complicated, absorbs time and costs. If there is a necessity of building software without focus on technical aspects, with paying maximal attention to client's business needs, V**XTEN** will be perfect, cheaper alternative for the solutions existing on the market.

In which areas V**XTEN** can be used?

- Building extended company management systems containing communication, sales and planning modules. Using V**XTEN** platform, TENVIRK has created three big systems having many sector variants:
  - **TenvirkMK** – communication, information and documents management system;
  - **TenvirkERP** – sales, warehouses, financial settlements, resource planning system;
  - **TenvirkCM** – educational institutions and universities management system.
- Quick building applications automating chosen firm's business processes such as client service, work planning, complaints, service, communication, settlements with employees etc.
- Building systems (CRM class) for monitoring contacts with client, documents circulation, supporting ISO, marketing and sales management – TenvirkMK system is an example.
- Building simple WWW (CMS) services based on database. The example is TENVIRK service center.
- Building applications integrating with other firm's systems and publishing data in Internet. V**XTEN** uses technology of integrating with other systems based on WebServices.
- Mobile systems for collecting data in a certain area and sending it online or offline to central database.
- Branches' data integration in dispersed organizationally companies. Reporting to headquarters of sales network or franchise networks.

V**XTEN** is a technology, which can be used also by TENVIRK's partners to independently develop technical area of applications. There is a possibility of modifying applications on several levels depending on technical advance level. We can distinguish the following levels of interference in created applications:

Advance level (from the lowest)	**Description of competence scope**
Basic implementations	Competence scope: • configuration of access authorization to business processes; • dictionaries editing; • default values editing; • designing a report view from a given list of fields; • small forms modifications (hiding fields, changing labels' names).
Advanced implementations	Lower level competences and: • border modification of business processes • modifications of business objects with forms
Basic programming	Lower level competences and: • border defining business processes; • building new business objects with forms and reports; • writing procedures in XTEN language, including procedures of integration with other systems; • building dialog forms using Visual Studio .NET.
Advanced programming	Lower level competences and: • writing libraries extending XTEN language using Visual Studio .NET; • creating new applications.

V**XTEN** layers

V**XTEN** is a **multi-layered business application engine**. V**XTEN** operates on the following layers:

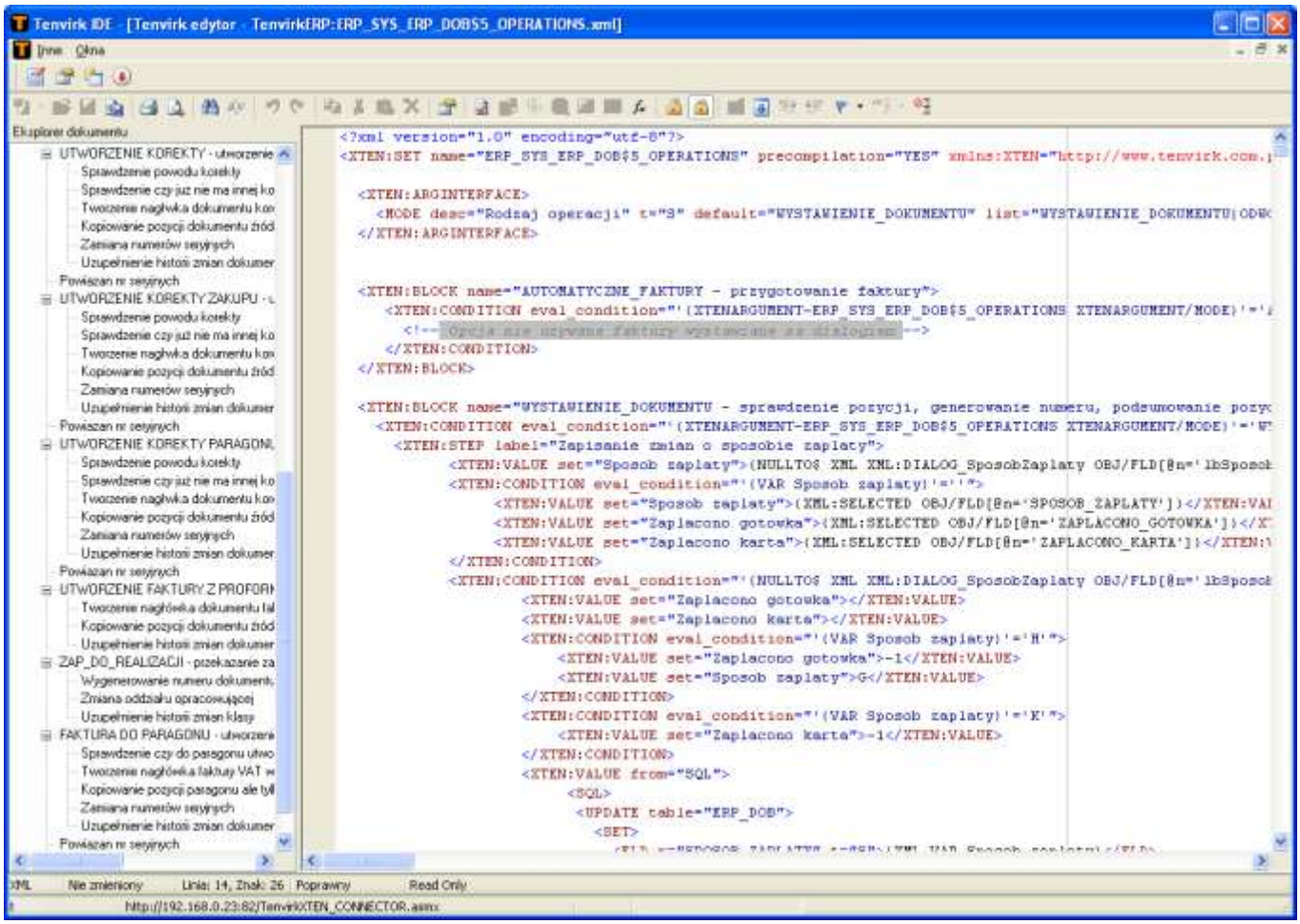
Layer	Components	Layer's destination
Application on client's side	Thick client: Windows applications or Windows Mobile	Rich in Windows application with convenient interface for end-user (firm's employee). It transforms XML data to visual form shown in the application.
	Thin client: application in an internet browser	Simplified interface, not requiring learning and working very fast. Mostly used to publish data to clients (internet secretariat). Works also on mobile devices.
	Windows automation service	Windows services (works as a system service without user's interface) used to automate recurring processes connected with communication and monitoring.
Extended application on client's side	Forms, dialogs and libraries worked out in Visual Studio .NET	Extension of Windows applications and services functions, including advanced functions using rich .NET components and controls of type GRID, CHART etc. Communication functions (e-mail, fax, SMS).
Transport layer by Internet or local network	Thick client: XML/WebServices – data HTTP – files upload and download	Compressed and encrypted (AES algorithm) XML data passing application data and interface. Files upload and download. Additionally the layer can be encrypted with SSL protocol.
	Thin client: HTML	HTML data, ready to be shown in internet browser. Additionally the layer can be encrypted with SSL protocol.
IIS	Internet server embedded in Windows	Intermediates in communication between client and server part of VXTEN platform application.
Definition of business processes	Map of application business processes	Defines user's interface and the business object's moves between the states. Defined with Business Process Graphic Interpreter – tool of VXTEN platform.
Definition of application objects	Definition of database and visual form of business objects	Defines user's interface as forms and structure of business objects storing in database tables.
XTEN engine established in COM+ infrastructure	XTEN procedures and forms definitions	Interprets the definitions of business processes and application objects according to user's demands attaching XML data and, if necessary, its graphic representation in HTML form. The engine uses dispersed COM+ transactions (embedded in Windows) ensuring multi-accessibility, scalability and reliability.
Libraries extending XTEN engine in .NET	Procedures extending abilities of XTEN language	Advanced XTEN functionality extensions, including advanced calculation and auxiliary functions.
SQL Server 2000/2005/2008 database	Tables with data	Storing the data of particular business objects.
File server: Windows 2003/2008 Server	Files in a standard Windows NTFS system	Storing compressed and encrypted files for EVENT-COMMUNICATION module and TENVIRK FILE MANAGER (management and versioning of firm's files).

V**XTEN** details

Existing on the market solutions for creating applications were mostly equipped with access to Internet and business process support at a later time. Often the only one way to work online by Internet is to use not much effective access by terminal. Mean-while VXTEN platform from the beginning was designed with a view to **working online and offline** in different internet scenarios. **It does not require terminals or VPN**, because it uses XML and WebServices to send data by Internet. As a result the costs of infrastructure for work in multi-branch companies are minimal.

TENVIRK has created its own unique language called "XTEN" for business procedures programming. This language is based on XML syntax and contains only less than twenty instructions. Therefore it can be used not only by programmers but also by employees responsible for implementation. This language describes the way of getting data from database and how to execute operations connected with business process execution (including conditions defining and data modifications). A typical example of usage is describing with this language a process of invoice issuing for a client. The language is interpreted so it is accessible for both: programmers and employees responsible for implementation. It enables them to change the procedures in end-application working on production server.

The figure presents XTEN procedure example:



Application created in V**XTEN** can present data in parallel – in the client application in Windows and also through an internet browser. In this purpose it can use the same procedures and forms definitions, what saves programmer's time, because there is no necessity to design forms separately for Windows application and for Internet.

As a result of applying a flexible and able to rearrange architecture, the system built with V**XTEN** technology can work in the following modes:

- **desktop application** (on a single workstation, without IIS and transport layer. It increases a speed of working on mobile computers);
- **application in local network**;
- **application in internet network** working remotely in a thick client mode (Windows application) as well as through an internet browser.

Applications created in V**XTEN safely manage database connections** by creating sets of resources without continuous holding connection to database. As a result many users can work with database without weighing it down. Thanks to using **COM+ infrastructure** the applications work with automatic dispersed transactions, what gives high level of application reliability.

Applications created in VXTEN can work in the following modes:

- **online** – connecting to central server without necessity of using terminal or VPN, just through port 80 (in local network) or 443 (SSL for encrypted connections);
- **offline** – using its own replication mechanism in forced or continuous mode. It enables synchronizing data with main server without stopping the work;
- **multi-branch** – within one database there is a division to many branches with partly separated data but ,for example, common data analyses and communication;
- **multi-firm** – within one database or within many databases on one server (ASP mode – Application Service Provider);
- **with mother** – passing analytic data to a superior server using integrating service and WebServices;
- **pear to pear** – passing communication data using WebServices technology, for example within many companies working separately within franchise network.

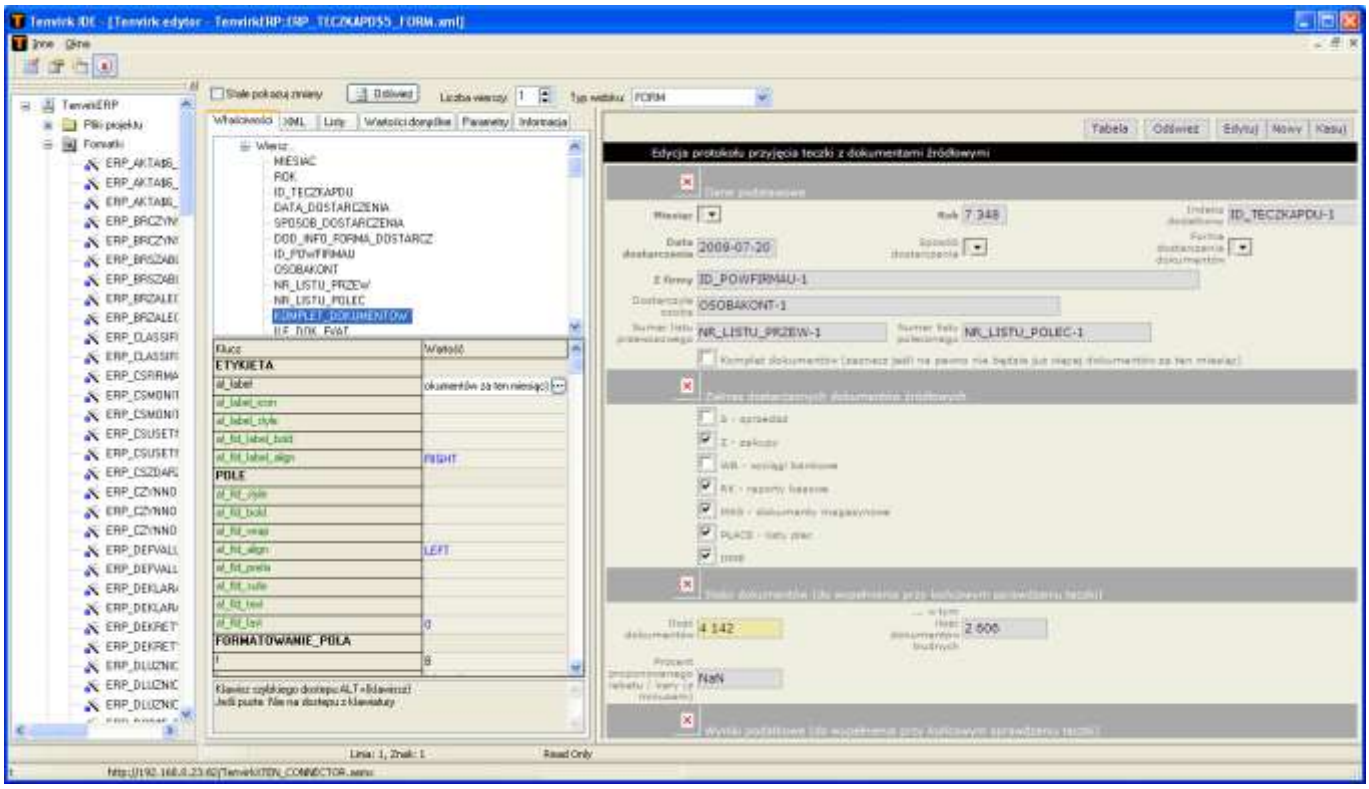
creating in V**XTEN**

During designing V**XTEN** platform it has been noticed that **everything what happens in a company is a business process**. Therefore the whole application design in VXTEN technology is reduced to designing business processes. 90% of time of creating application in VXTEN is used to work with graphic tools and writing business procedures in XTEN language.

Business application created in V**XTEN** arises in several stages:

- in a description of a future application we distinguish such objects as documents, persons, products and relations between them;
- we enter the information about the objects and the relations, we determine how the object communicates with database and what is its visual view – everything using integrated developer environment;
- we describe business processes using Business Process Graphic Interpreter. We create the **map of processes**. On this basis the system automatically creates user's interface, which is dynamically transformed depending in which part of business process the logged user participates;
- Using Visual Studio .NET we add advanced functionality if it is necessary in a particular application. Thanks to this we can apply advanced rich controls. At the same time the programmers have easier work because of completed libraries connecting with main application. They are not able, even if they make a mistake, to damage application.
- Debugging and errors searching in the application is especially simple because of rich activity reporting, embedded internet debuggers and automatic procedure of testing and logging. In every moment it is possible to trace the number of processed transactions and the current system usage (what is significant for the systems working with hundreds of users at the same time).

*The figure presents designing the forms on V**XTEN** platform:*



V**XTEN** technology is equipped in special tool called "**Business Process Graphic Interpreter**" (BPGI). This is a tool, which enables designing the course of business process in a graphic way and then move them automatically into information system. This tool can be used in many stages. Starting from IT company (software producer), which prepares a basic set of business objects using graphic tools, creators and Microsoft Visual Studio integration, through the implementing company, which builds, also using the graphic tools, a graphs presenting particular client's business processes. Previously defined business objects such as offers, sales documents, turnover documents, accounting documents, marketing documents are parameterized using a set of features. Such prepared business process automatically creates user's interface for particular points of process, where an interaction with people is expected. Applying the language of business procedures – XTEN (simple syntax built in XML) enables precise defining the details of action of particular business processes.

A special feature of XTEN language is separating a data circulation from technical level. Therefore it is perfectly suitable for integrating with other information systems in a company. In this purpose it uses the whole set of technologies including WebServices. Additional advantage of the language is covering all the processes with COM+ dispersed transactions, what excellently increases efficiency and stability of created systems and also provides them with scalability.

A very valuable aspect of building systems with BPGI is possibility to **merge pre-implementation analysis phase with the phase of prototyping** and system verification by user. Therefore it is not necessary to use CASE type tools. Thanks to using internet technologies, design phase and implementation phase can be conducted by **remote developer teams** (working in dispersion by Internet).

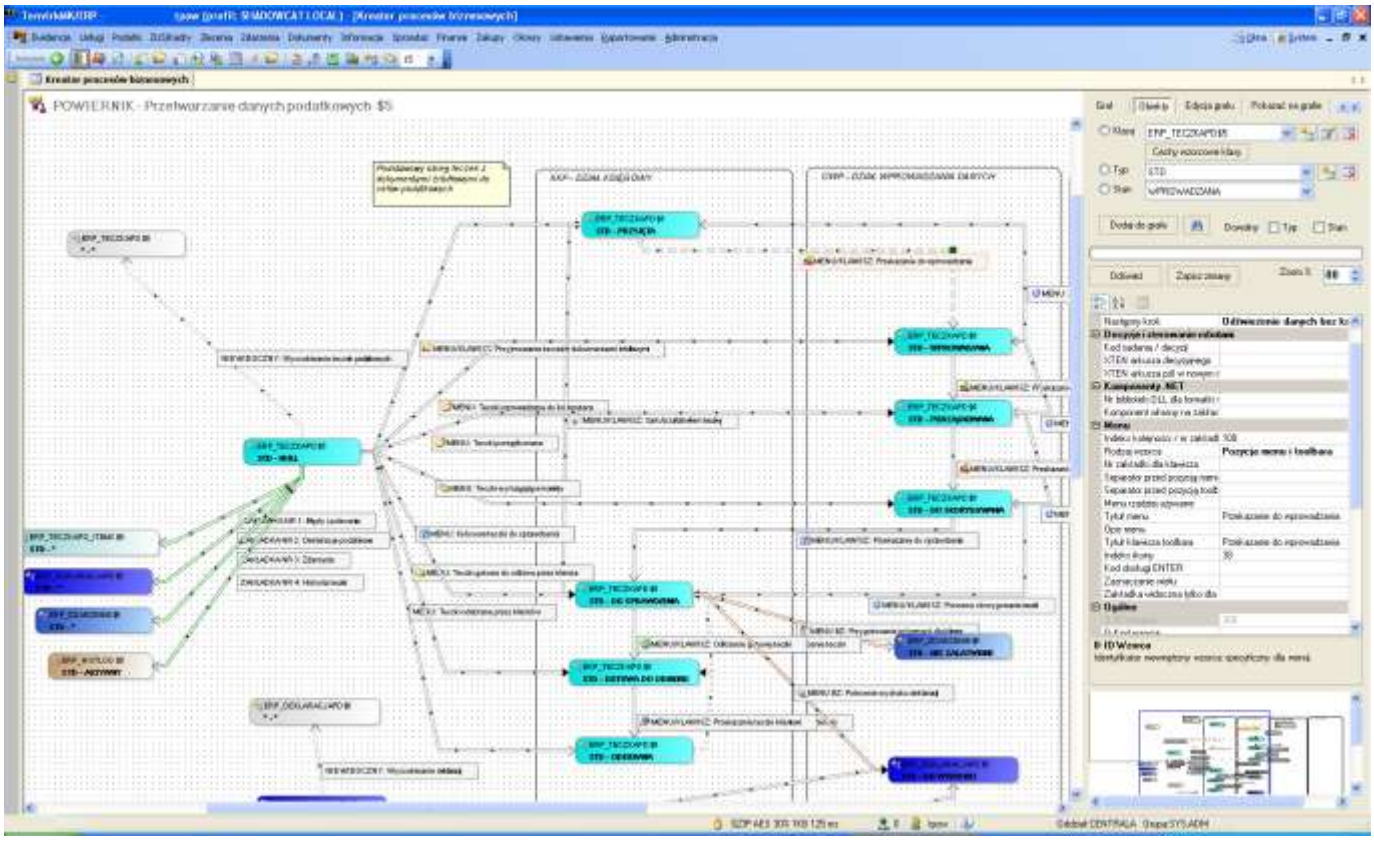
The process approach reduces chosen aspects in company to a model similar to an assembly line, where role of the line belongs to an information system. The users of the system can be people executing proper repeated activities as well as "automates" - other information systems, service programs (Windows services), substituting people in data providing.

The example can be using V**XTEN** for automating firm's communication processes or automatic informing clients about many cases, for example debts. Interesting function of the V**XTEN** applications is enabling user with wide abilities of administering the system including groups and users administering, management of authorization to business processes. The business processes modification is possible in a precisely determined range, which excludes system damage, but enables flexible adjusting to changing market situation of the company.

TENVIRK has worked out also an authorial tool called "**Business assistant**" helping an end-user to move among the tasks resulting from business processes included in the information system. This tool steers the user's work like a navigation however not a car navigation, but the business one.

Application building process is supported by the system of half-automatic creating project documentation and help for users. Therefore the system, which is individually prepared for an end-user, has a rich documentation despite having specialized functions.

The figure presents tool for building processes map and user's interface.



Many IT companies declare that they are able to flexibly prepare application according to client's requirements. Often these are just empty declarations and applications can be adjusted only with hundreds of options, which are inconvenient to set. Building additional functionality is often expensive and requires a big amount of time.

Mean-while TENVIRK from the beginning designed V**XTEN platform with a view to individual solutions for clients.**

During the work on management implementation in particular branches TENVIRK has created a library of hundreds of complete business objects and graphs describing business processes. Preparing application or adjusting it is similar to building LEGO blocks. The only action is to determine, which objects and graphs will be used by chosen client. VXTEN on a developer server enables maintenance of separate version for each client. Therefore the clients can be updated independently. Such solution causes that clients receive only ordered functionality without necessity of updating functions they will never use.

Because of the installation complexity and providing individual versions, V**XTEN** platform is equipped in a mechanism of **automatic updating client and server part**. Additionally TENVIRK has created a remote system for monitoring application's condition. Therefore TENVIRK ensures almost 100% reliability of application work, what is especially significant at firm's communication service.

realizations in V**XTEN**

Communication management

On the base of V**XTEN** platform a separate communication system has been built. It is able to completely overtake receiving and sending **e-mails, faxes, SMS-es** and **internal communication** between employees. Additionally the system creates a **pear to pear communication between firm's branches**, firms within franchise networks or for example groups of commonly working business entities. Communication system worked out by TENVIRK completely substitutes programs and expensive corporate solutions applied so far.

File management

V**XTEN** platform enabled creating innovative file management system – TENVIRK FILE MANAGER. The system works in a usual Windows explorer. It enables file versions management. It works by Internet enabling upload and download of files of any size, with compression and encryption. TENVIRK FILE MANAGER is the first file management system, which is integrated with company and communication management system.

Multi-dimensional analyses and reporting

V**XTEN** platform has been equipped with its own mechanism of reporting and building data analyses. The system enables designing reports by programmers, employees responsible for implementation, as well as end-users. Graphic tools enable building complex multi-dimensional reports working online by Internet. Separate mechanism enables building **multi-dimensional data analyses** using RTOLAP. The analyses enable creating graphs and data tables and also applying a "drill down" technique.

The example of branch realizations created using VXTEN platform

- Management system for network language schools.
- Management system for project office using the file versioning system.
- Tax office management system.
- Management system for cell phones network.
- Management system for publishers, coordinating work of sales representatives in an area.
- Communication management system for sales companies.
- Management system for service in companies conducting IT implementations.
- Used in TENVIRK management system for IT company and controlling source code versions, also created in VXTEN (TENVIRK FILE MANAGER) technology.
- Integrations with financial/accounting systems such as Symfonia Forte, CDN XL. Integration with bank systems such as Multi Cash. Integration with e-learning platforms.

safety

V**XTEN** platform enables creating safe systems working in Intranet, Extranet or Internet. From the beginning it has been **designed with a view to safety** and working online. Among the others the following protections have been applied:

- safe application architecture disabling typical attacks;
- transmission encryption outside (through SSL) and inside the network. The encryption uses AES algorithm;
- protection of potential remote access to system using double certificate system: server and client in X.509 standard;
- applying strong passwords;
- centralization of access to files containing documents and correspondence on a protected server;
- automatic creating backup copies with its transfer and encryption;
- building advanced hierarchy of access to data based on defining authorizations for groups and single users. Defining authorizations is convenient because of the fact that one person can be assigned to many groups and authorizations can be granted or revoked.
- additional vertical divisions of access competence to correspondence and data through substitutions, secrecy levels, division into branches;
- registering the history of all changes of objects and users' activities;
- protecting access to files containing documents and precise registry of versions history, changes of files and also the fact of viewing the files;
- reducing storing correspondence and files outside the server;
- encrypting files and correspondence on the server. It reduces the risk of information leakage in case of overtaking the server;
- continuous monitoring condition of the installation with automatic notifying.

requirements

V**XTEN** technology is compatible with .NET Framework 2.0, 3.x and COM+ model and also with MS SQL Server 2000, 2005, 2008 databases. VXTEN applications can be run in a client part on computers with Windows 7/VISTA/XP/2000, and in a server part on Windows 2003/2008 Server (STD, SBS, WEB). The applications can be run on 32 and 64 bit machines.

awards for V**XTEN**

Applications created in VXTEN technology have been several times awarded in competitions organized by Microsoft.

TenvirkMK application was included in **laureates group of "Be the first one with Microsoft"** application competition in November 2005. The statuette has been given by Tomasz Bochenek, Microsoft sales and marketing on Middle-Eastern Europe general director. TENVIRK has worked out a new prototype version of TenvirkMK and TenvirkCM (for schools) programs on SQL Server 2005 and .NET 2.0 platform. Therefore the systems created by TENVIRK company are the leader of technology.

TENVIRK application has been recognized as one of the best prepared for work with new Windows VISTA – recognized with the title:
"The best application compatible with Microsoft Office 2007 System and Microsoft Windows Vista."
Awarded applications were presented during Microsoft Technology Summit 2006 conference.

Application of the Year 2006 – distinction in as many as three categories for the best debut for TENVIRK:

"5th April 2006 in a Ball-room of Marriot hotel in Warsaw, during 14th Industry Solutions Days conference, the celebration of presentations of awards in Application of the Year 2006 competition took place. The competition awards, commemorative diplomas and statuettes have been given by Mr Marek Roter, Microsoft polish branch Chairman. Despite the fact that there were 6 Applications awarded in the competition, almost 20 ones were nearly successful. Jury's work was supported by Polish Applications Catalog users, which decided about final classification by their votes. The competition website, which had presented descriptions of the programs participating in the competition, was visited by over 50 000 persons!"
(materials from Microsoft website)

TENVIRK application has been distinguished for the best debut in as many as 3 categories:

The best application supporting costs and income analysis in a company. "Professionally prepared tool. (…) flexible user's interface. Interesting solution (…)." - Krzysztof Gawęda, competition juror.

The best application supporting information management in a company:
"The main strength of these applications is yet framework and basing the application on WebService. Bravo for "not blocking" interface. Interface, which is usable despite the server is located far away. The interface is thought-out, simple and cohesive; The functionality is at least good." - opinion from Tomasz Kopacz, competition juror.
Tenvirk application has been awarded in this category by consistent votes of jurors and the audience.

The best application supporting company's work. "(...) the product is very interesting and worked out, that is the reason (…) of such judgment." - from Tomasz Cieplak juror's judgment protocol.

One of our applications – TenvirkCM has also achieved a distinction in **Application of the Year 2005** competition. The Application of the Year 2005 competition has been organized by Microsoft polish branch together with Computerworld weekly magazine and Academic Environment. 73 applications participated in Application of the Year 2005 competition. Definite majority of the solutions represented very high level, so the jury had to face a difficult choice.

other information

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