



IPRO 349 ~ Group 2.3 Project Plan
Data Migration Tool for CDN XL –
Importation of Data from Heterogeneous Sources



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Illinois Institute of Technology and AGH University of Science and Technology
Krakow, Poland

June 26, 2007

Executive Summary

The objective of this IPRO subteam is the improvement of the importation of data to CDN XL in small and medium enterprises sector. This subteam is working toward the problem of improving the way data is imported from customer to CDN XL (an ERP system). The methodology to be employed is the agile methodology. The expected result of this project is a preliminary software system for importing data from Excel or other heterogeneous files to CDN XL.

The goal of the team's project is to develop a program to for the importation of data from customers to be imported into the CDN XL system to be used by the deployers. The deliverables at the end of the project will be a template for customers, program to extract the data. The team will examine the process of importing the data to develop a program that is generic enough to import different types of data.

This project plan is separated into the objective section, where the objective of the subteam is fully explained. In the background section, the background of the project and sponsor are detailed. Also, a diagram of how the CDN XL system works is included. Furthermore, the technology used and possible ethical issues are addressed. The third section describes the methodology being used. The way documentation of work is also addressed in this section. In addition, the risk management and quality assurance will be addressed in this section. The expected results are explained in the fourth section – the form it is in as well as potential products that might arise from this project. In the sixth section, the tasks, duration of each task and milestones are included. The team members are introduced in the seventh section. Finally, in the last section, the designation of roles – what each team member is responsible for – is detailed.

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1.0 Background

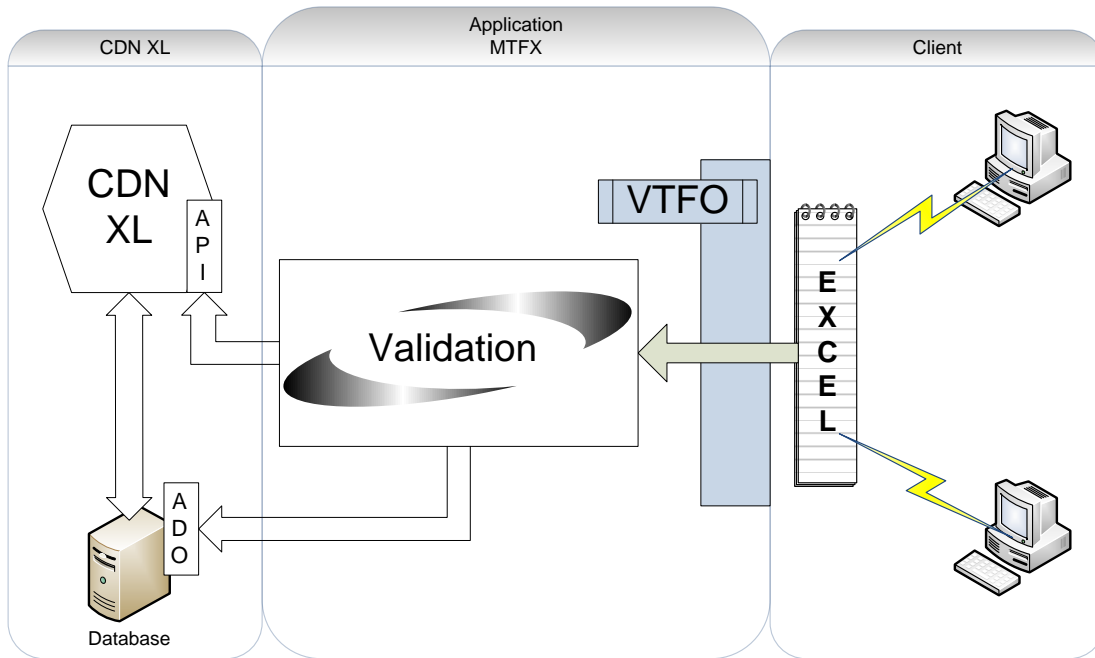
In this IPRO subteam, two IIT students are working with two students from the AGH University of Science and Technology in Krakow, Poland. The customers involved are the small and medium enterprises. The sponsor of the subteam is Comarch – a fast-growing global software house and systems integrator. Though its headquarters are in Krakow, Poland, Comarch has international offices worldwide.

The IPRO course will concentrate on possible economic, social, cultural and ethical problems that the Information Technology industry faces. Even though this is not a requirement from Comarch (which develops IT solutions), team members will understand the role of start-up companies and universities in the local area. In addition, other problems that may arise include technology, physical infrastructure environmental impact, political trends and historic preservation. Such possible issues might complicate the smooth running of IT solutions.

This subteam is working toward the problem of improving the way data is imported from customer to a certain system. This system, CDN XL is an ERP system in which customers are given templates to fill in their data (generally in the form of Excel). Such data is then imported to CDN XL after validation. ERP is the use of technology to enhance the success of business objectives. This project is important because it can decrease the cost of deployment and time spent. This project will also make business transactions faster and less expensive.

Figure 2.1 – Model of CDN XL

In this figure, the CDN XL system is modeled. The source system of customers is inputted into Excel templates. Using the Migration Tool for CDN XL (MTFX), these templates are then put through the validation process through the VTFO interface. After validation the Excel templates are imported to CDN XL through the Application Program Interface (API). Also, these validated Excel templates can be imported to another database through the ADO interface. Furthermore, data can migrate between this database and CDN XL.



The technology involved in addressing the problem includes using Windows, Microsoft Outlook, Microsoft Visual Studio, C# programming and .NET framework, MS Visio, MS Project, and CDN XL. However, there is no other information on the historical success or failure of previous attempts in addressing the problem because this will be the first time this problem is addressed. Currently, there are several programs to import data that are in different forms, importing different tables separately. In this project, an integration of the different forms into one uniform, consistent system is planned.

Ethical issues that may be involved to investigate the problem include not downloading software illegally and not using work done by someone else as one's own. One moral issue is being mindful of the other teams working in close proximity to each other and making sure to respect their project and efforts as we work on our own tasks. Cultural issues include the fact that team members from the large, fast-paced city of Chicago are working with team members from the smaller, more tranquil city of Krakow, Poland. Of course, there are cultural issues with living in a foreign city, where Polish is used more widely than English.

Since an analysis of the ERP market will be performed, the business or societal costs of the problem is minimal. After the necessary software is installed and the necessary familiarization of the topic is completed, the subteam will work on improving the running of small and medium enterprises.

2.0 Methodology

The initial steps for the accomplishing the objectives is to set up the necessary software and become acquainted with the concepts. The first week of the term was spent accomplishing the previous steps. The project is to be completed by July 19th so the remaining tasks must all be completed by our due date. The following week of the term is for preparing the deliverables for IPRO Day. The little time available to accomplish all the tasks requires the team to follow a method which will compliment the time frame. The methodology to be followed is Agile Methodology.

2.1 General Concepts on Methodology

The Agile Methodology is a light-weight methodology that will minimize risk and concentrate on a few tasks in an iteration. It also cuts down on the unnecessary documentation not needed by the end-users. This methodology is a means of dividing the entire project into small time boxes each ending with its own final product. The process of agile methodology is design, develop, and integration. This is done in every iteration. Planning the project by iterations results in not knowing all of the possible steps and tasks that will need to be done. This means that at the beginning of an iteration the tasks to be done will be determined at the beginning. Each iteration will build upon the product to move closer to the final product. While the exact tasks of each iteration is not known at the beginning the process that will be followed to accomplish all goals will be that of design, develop, and then integrate.

2.2 Risk

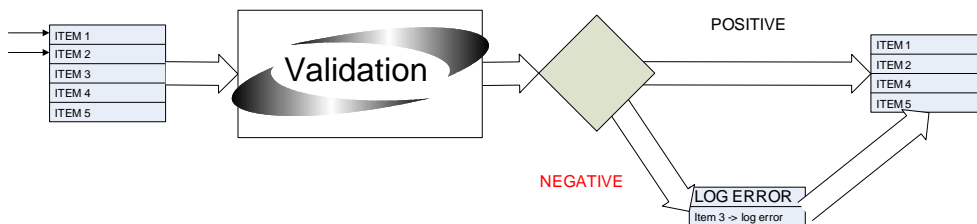
There are risks in this project that must be managed. One is developing a structure of database that is too difficult to easily understand. The level of this risk is medium. This risk will be managed by monitoring small steps and consulting the supervisor. Another means of risk management is maintaining frequent communication with the deployers and customers. Another risk is the problem with technology; the possible risk is that technology being used cannot meet the needs of the design. This is a low level risk which will be managed by collecting documentation and asking the supervisor as questions arise. The third and final risk that has been identified is having problems with validation. This has been labeled as a low level risk. To manage this risks test files will be implemented and checked frequently to ensure the program is working as it is designed to work.

2.3 Quality Management

One primary focus needs to be quality control. To manage quality each step of development will have a test designed to ensure the prototype is functioning as intended and correctly. Tests will be designed by making sample data files that will be run through configuration and validation. The tests will consist of running sample files some of which are correct while others have errors.

Figure 2.3.1 Validation Process

After configuration, a validation process will take place, where data types are checked to make sure they are in the correct format. Our methodology is one where if an item goes wrong, the system will skip it and move on to other items – contrary to the all-or-nothing methodology. This error will be logged so that it can be fixed at the end of the process. On the other hand, if validation is positive, the process continues to the next item.



At this point, it seems reasonable for this subteam to accomplish most, if not all, of the required tasks within the timeframe and with resources available. Potential solutions will all be tested against each other so that the best solution is chosen. Results of research and testing will be documented in the form of minutes and deliverables posted on iGroups. In the minutes, the agenda is listed and the accomplished tasks are documented.

Also, additional documentation of work is in the form of individual diaries and computer programs. In addition, the subteam will analyze test results and make sure that it is working as it is designed to work. The IPRO deliverable reports will be generated as a team, using the information gathered from diaries, minutes and work performed during the internship.

3.0 Objectives

The main objective of this subteam is to create application and to provide functionality of importing data from external sources to CDN XL database (MS SQL Server). CDN XL API will be used for most of the data and ADO API will be used for data that cannot be transported by CDN XL API.

Furthermore, the application needs to cover full functionality of this kind of program, so the deployer will not need to use another tool for importing some specific data. So the application will provide functionality to import data from the Excel files as main external source, and in future from another database.

Goals for the project:

- Decrease time needed by deploy and speed up deployment process
The deployer will need much less time for importing data from Excel files or previous database. The project assumes that the deployer needs to select file that he wants to import and the rest of importing data process will be realized by application. If there would be any errors in validation sub process the deployer will need to correct them only.
- Reduce cost
The application will reduce cost of deployer work because it is going to replace many of tasks that he would need to do manually.
- Communication integration with CDN XL
The project assumes communication integration with CDN XL application. It will be based on CDN XL API which will be used for transporting validated data from excel files or other external sources to system database.
- One common version
The project will integrate at least few different external sources for importing data and have full functionality to be a professional tool for deployer's work
- Versioning of application based on API version
The application will have versioning connected with actual CND XL API version

4.0 Expected Results

The expected result of this project is a preliminary software system for importing data from Excel files to CDN XL. Results will be in the form of a software system. Potential products include an improved prototyping tool alternative to Visio and an integrated, consistent system to import different forms of data templates and tables. Also, new products for Comarch might result. Potential outputs include C# programs and other deliverables and reports. The expected results in terms of deliverables that will be produced by the subteam include a final report that incorporates the process. The results expected will address the problem of the sponsor/customer by improving the running of business objectives time-wise and production-wise.

Functionality:

- Importing data from different sources
The application will be allowing importing data from different external sources. Every excel template file will have single table with columns names and data organized in rows. The application will be reading data from chosen file to structure called DataTable. If the source is database, the application will read table by table from chosen database. Then the tables will be validated.
- Configuration :
 - Database properties
The first task after installing application by deployer will be to set database configuration parameters like server ip address, login, password etc.
 - Testing the connection
The user will be able to check if the parameters mentioned above are correct.
- Validation
 - Checking templates
 - Table type for chosen file
The application will be checking if chosen table type by user is proper with select file (i.e. proper columns names)
 - Type checking
The application will be checking if columns types in selected template file are equal to chosen file type
 - Checking if primary keys are unique
Application will be checking if columns that are primary keys in table are unique. It can be done by reading the current data stored in database and comparing it with data taken from external source.
- Saving validated data into database
 - ADO and API
The main goal of project is to use CDN XL API for storing data into database, but this API can be insufficient, so the application will have implemented second way of data storing – by ADO interface the data will be stored directly to database.
 - Storing process

Data Migration Tool for CDN XL

The project assumes that data will be stored step by step in transaction mode. If an error occurs the current item will be skipped and next item will be stored. Error message will be stored in error log

- Handling errors

The project assumes that the most common errors will be handled and properly described, so the deployer will be able to identify the problem easily. The error message will include the number of table row where the error occurs and will try to show hint how to manage with this error

5.0 Project Budget

Since the project budget is not applicable to this project it is omitted.

6.0 Schedule of Tasks and Milestone Events

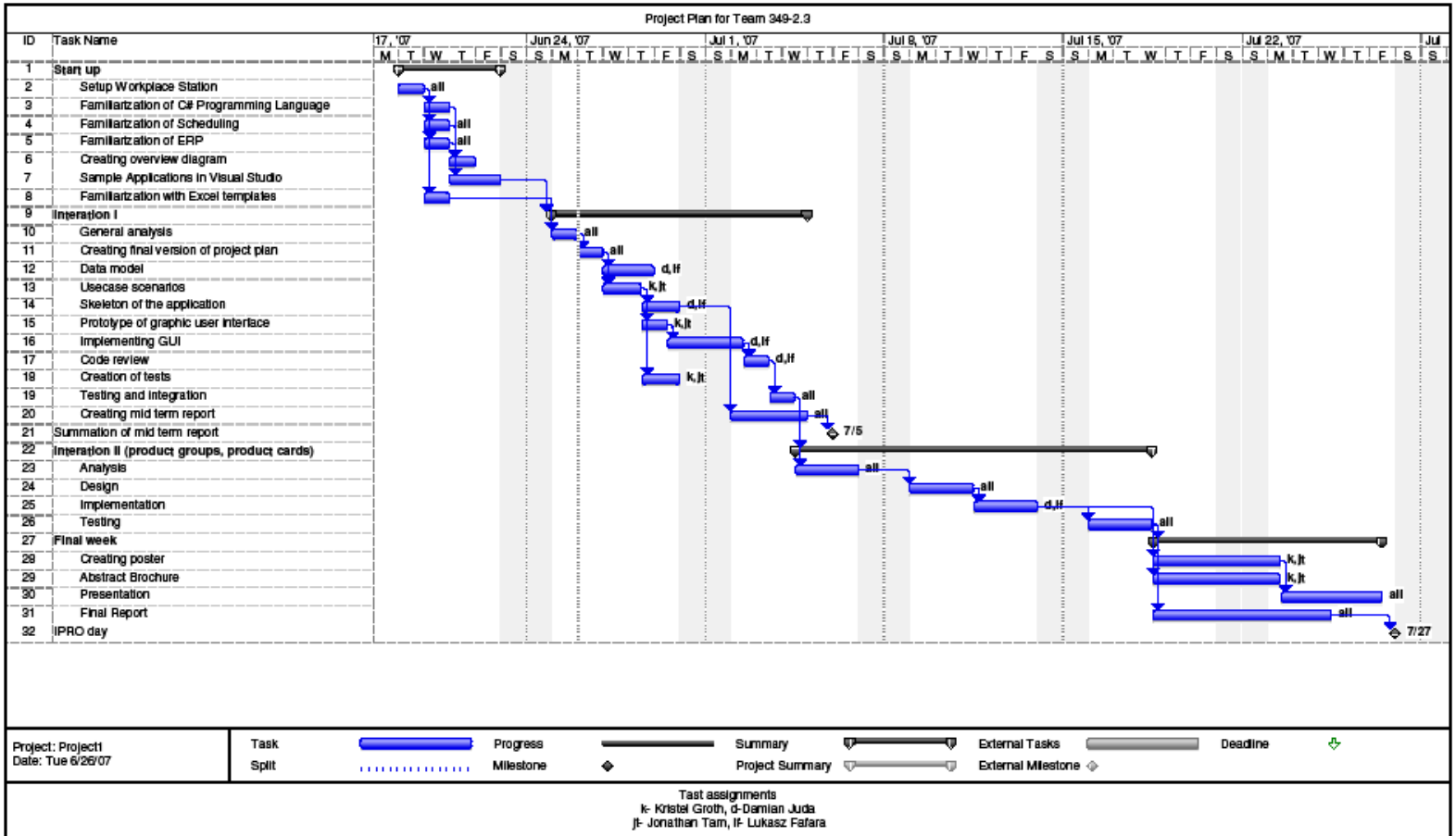
As stated in the methodology section Agile Methodology will be used. Because of this all of the tasks are not planned. Tasks will be planned at the beginning of each iteration. Once the first iteration is complete the tasks for the following iteration will be determined. Because of this style there are only broad tasks outlined past the first iteration which consist of analysis, design, implementation, and testing. Two images from Microsoft Office Project 2007 of Project Plan for Team 349-2.3 are provided to demonstrate the schedule of tasks and milestones that have been recognized.

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Figure 6.1: Break down consisting of task names, expected duration, start and finish dates, and assignment, identified initials in Resource Names, of the identified tasks.

Project Plan for Team 349-2.3						
ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1	Start up	4 days?	Tue 6/19/07	Fri 6/22/07		
2	Setup Workplace Station	1 day	Tue 6/19/07	Tue 6/19/07		all
3	Familiarization of C# Programming Language	1 day?	Wed 6/20/07	Wed 6/20/07	2	
4	Familiarization of Scheduling	1 day?	Wed 6/20/07	Wed 6/20/07	2	all
5	Familiarization of ERP	1 day?	Wed 6/20/07	Wed 6/20/07	2	all
6	Creating overview diagram	1 day?	Thu 6/21/07	Thu 6/21/07	5,4	
7	Sample Applications in Visual Studio	2 days	Thu 6/21/07	Fri 6/22/07	3	
8	Familiarization with Excel templates	1 day	Wed 6/20/07	Wed 6/20/07	2	
9	Iteration I	8 days?	Mon 6/25/07	Wed 7/4/07		
10	General analysis	1 day?	Mon 6/25/07	Mon 6/25/07	8	all
11	Creating final version of project plan	1 day?	Tue 6/26/07	Tue 6/26/07	10	all
12	Data model	2 days?	Wed 6/27/07	Thu 6/28/07	11	d,lf
13	Usecase scenarios	1.5 days?	Wed 6/27/07	Thu 6/28/07	11	k,jt
14	Skeleton of the application	1.5 days?	Thu 6/28/07	Fri 6/29/07	13	d,lf
15	Prototype of graphic user interface	1 day?	Thu 6/28/07	Fri 6/29/07	13	k,jt
16	Implementing GUI	1 day?	Fri 6/29/07	Mon 7/2/07	15	d,lf
17	Code review	1 day?	Mon 7/2/07	Tue 7/3/07	16	d,lf
18	Creation of tests	1.5 days?	Thu 6/28/07	Fri 6/29/07	13	k,jt
19	Testing and integration	1 day?	Tue 7/3/07	Wed 7/4/07	17	all
20	Creating mid term report	3 days	Mon 7/2/07	Wed 7/4/07	14	all
21	Summation of mid term report	1 day?	Thu 7/5/07	Thu 7/5/07	20	
22	Iteration II (product groups, product cards)	10 days?	Wed 7/4/07	Wed 7/18/07	19	
23	Analysis	2.5 days?	Wed 7/4/07	Fri 7/6/07	19	all
24	Design	2.5 days?	Mon 7/9/07	Wed 7/11/07	23	all
25	Implementation	2.5 days?	Wed 7/11/07	Fri 7/13/07	24	d,lf
26	Testing	2.5 days?	Mon 7/16/07	Wed 7/18/07	25	all
27	Final week	7 days	Wed 7/18/07	Fri 7/27/07	26	
28	Creating poster	3 days	Wed 7/18/07	Mon 7/23/07	25	k,jt
29	Abstract Brochure	3 days	Wed 7/18/07	Mon 7/23/07	25	k,jt
30	Presentation	4 days	Mon 7/23/07	Fri 7/27/07	28	all
31	Final Report	5 days	Wed 7/18/07	Wed 7/25/07	26	all
32	IPRO day	1 day?	Fri 7/27/07	Fri 7/27/07	31	

Figure 6.2: Branched breakdown of task to be completed.



IPRO Tasks	Due Dates
First Class	18-Jun
Project Management Workshop	19-Jun
Reflection I	22-Jun
Ethics Workshop	26-Jun
Project Plan	26-Jun
Mid-Term Review Session	5-Jul
Mid-Term Report	6-Jul
Reflection II	6-Jul
IPRO Day Guidelines and Tips	17-Jul
Exhibit/Poster	23-Jul
Abstract/Brochure	24-Jul
Presentation	24-Jul
Final report	25-Jul
Team Work Product; Minutes	25-Jul
Reflection III	26-Jul

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IPRO Projects Day Conference 27-Jul
Debriefing 28-Jul

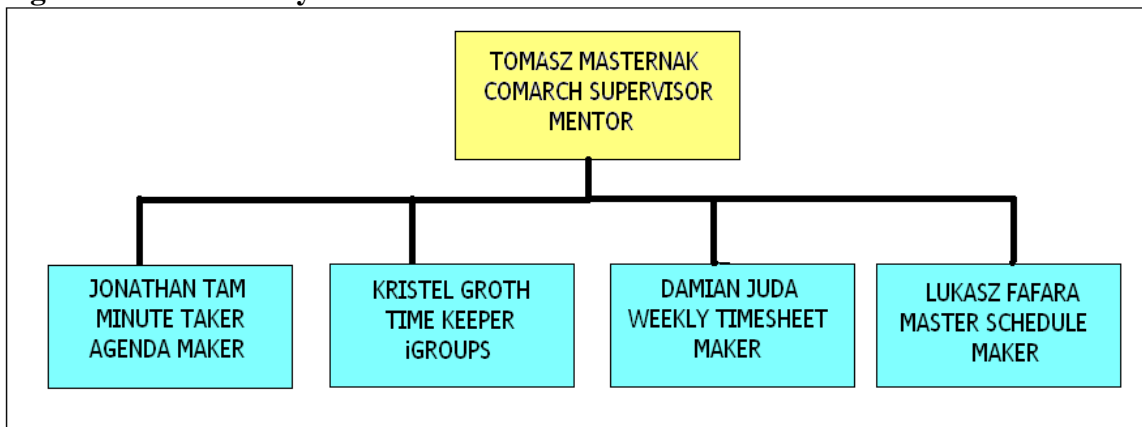
7.0 Individual Team Member Assignments

Team Members	Major	Skills
Groth, Kristel	Molecular Biochemistry	Interpersonal
Tam, Jonathan	Biophysics	Interpersonal
Juda, Damian	Civil Engineering	Computer
Fafara. Lukasz	Computer Science	Programming
		Computer
		Programming

8.0 Designation of Roles

Roles	Team Member
Minute Taker	Jonathan Tam
Agenda Maker	Jonathan Tam
Time Keeper	Kristel Groth
Weekly Timesheet	Kristel Groth
Collector	Damian Juda
Master Schedule Maker	Lukasz Fafara
iGroups	Kristel Groth

Figure 8.1 – Hierarchy of Roles



Appendix A

Comarch

Comarch is a global IT business solutions provider specializing in forging client relationships to maximize customers' profitability and optimizing operations and business processes. Comarch primary advantage lies in huge domain knowledge accumulated in their software products which they use to deliver and integrate sophisticated business IT solutions.

Many of the large system integrators recently recognized the need to forge real strategic alliances with leading software houses in order to deliver a complete solution to their customers and seamlessly integrate it into their business processes, rather than act as resellers of a given package.

On the other hand, many software houses have been developing broad consulting practices around their applications. Since its inception, Comarch has always taken the initiative by providing world-class packaged applications as well as professional services to make the best use of them within the customer's environment. In this way, they have achieved the remarkable position as a total solution provider, completely controlling all strategic components of their solution stack, other than commoditized and standards-based technologies like database servers, application servers or hardware.

Today's IT systems are strongly affected by technological change and increasing market competition. Companies have realized that investment in technology may lead to the improvement of client relationships, the optimization of business operations, and a reduction of churn and costs. Together, these factors enable companies to achieve their ambitious business objectives.

Since its inception 14 years ago, Comarch has developed at a very fast pace. During this time, the company's development of innovative and efficient solutions for all vertical sectors of the economy has led to a rapidly growing, satisfied customer base. Today, Comarch is the leading IT company in Central & Eastern Europe and employs over 2100 highly experienced IT engineers and business consultants who staff an international network of subsidiaries and offices throughout the USA, Europe and the Middle East.

Comarch has been awarded an impressive number of contracts owing to the company's cutting- edge technology, broad knowledge of specific vertical markets, and refined sense of responsibility. Comarch boasts the execution of over 2000 complex IT projects and the implementation of their software in more than 40 thousand companies worldwide. It is a source of great pride that many of the international and prospective clients and analysts regard Comarch as the strongest Eastern European company to have entered the global IT market.

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Comarch is a software house and IT services company that specializes in innovative IT solutions for the Telecommunications and Financial Services industries, Government, Large Enterprise, and Small and Medium Business. Our products and solutions cover billing, network management, ERP systems, IT security, CRM and loyalty management, EDI, sales support, electronic communication and business intelligence.

Comarch's vision is to provide their clients with innovative software packages and licenses supported by Business Process Management and a full range of integration and professional consulting services that effectively change the way they do business. Comarch also provides comprehensive customer service following the implementation process to ensure that products are constantly updated in light of fluctuating market conditions and new challenges facing their clients.

Comarch reinvests more than 10 million Euros annually in Research and Development to support the enhancement of existing products as well as new generation product development. Comarch also organizes comprehensive technology programs involving their consultants, analysts and customers to ensure that technological aspirations are completely aligned with current and future market expectations. The product strategy conforms to quality management policy that is expressed in the recognized CMM model certificates and top level ISO certificates.

Appendix B

IPRO[®] SYLLABUS COMARCH INTERSHIP IPRO 349: The Interprofessional Project Course for Summer 2007

Class Meeting Information

(1) Classes meet with the instructor twice each week for 150 minutes (300 minutes/week total) as follows:

Day: Tuesdays Time: from 6:00 pm to 8:40 pm

Day: Thursdays Time: from 6:00 pm to 8:40 pm

Additional meetings and Web based activities – Six week intensive program

(2) Meeting Location: Comarch & Web

Instructor Contact Information

Instructor: Dr. David Pistrui	Office Location: Comarch/ 3424 S. Michigan 4 th floor
E-mail: pistrui@iit.edu	Office Hours: By appointment
Phone: (001) 312-371-8190	

Team Communication and Reporting Tools

iGROUPS, the IPRO Group Communication Tool (<http://igroups.iit.edu>) and iKNOW, the IPRO Knowledge Management System (<http://iknow.iit.edu>) are used by IPRO teams. Instructors and students who have used iGROUPS can use the same User ID and Password. Those who forget their password can click on a link and a new one will be emailed. If it is their first time, instructors/students go to <http://igroups.iit.edu> and enter the prefix of their regular IIT email address (“jacobius” from jacobius@iit.edu) for their iGROUPS User ID and Password. (Those who do not have an IIT email address enter their full email address instead of only the prefix.) The Password can then be changed, but the User ID remains the same.

IPRO Semester Events Summary

- | | |
|--|---------|
| A. IPRO First Class Session: | June 18 |
| B. Comarch Orientation: | June 18 |
| C. IPRO Project Management Workshop: | June 15 |
| D. IPRO Ethics Workshop: | June 26 |
| E. IPRO Mid-Term Review Session: | July 5 |
| F. IPRO Day Guidelines & Tips Session: | July 17 |
| G. IPRO Projects Day Conference: | July 27 |
| H. IPRO Team Debriefing Session: | July 26 |

Note: The Assignments section provides a comprehensive schedule in a table format with supporting descriptions.

Introduction

The IPRO[®] Program prepares students for the practical challenges they will face in a changing workplace by emulating a cross-functional team environment.

Multidisciplinary teams of students engage in semester-long projects based on contemporary open-ended problem solving opportunities from sponsors that reflect the diversity of the workplace: corporations, entrepreneurial ventures, non-profit organizations, government agencies, and university researchers. Teams may include

students from all academic levels (sophomore through graduate school) and professional programs (engineering, science, business, law, psychology, design, and architecture). Through two IPRO courses, students can develop a unique portfolio of experiences that can align their academic efforts with career directions that best fit their aptitude and interest. The activities and deliverables assignments, as well as the grading and assessment requirements develop in students the type of project competencies, cross-functional collaboration experience, team processes and peer evaluation methods that reflect professional practice.

Interprofessional Course Learning Objectives

The interprofessional course has the following primary learning objectives which are addressed in the process of grappling with a complex open-ended problem that requires collaboration by students from multiple disciplines:

- Development and strengthening of **Multidisciplinary** Team Building and **Teamwork** practices
- Effective use of **Project Management** methodology
- Effective use of Verbal, Written, and Visual **Communication** methods
- Awareness of **Ethical Issues** and demonstration of appropriate ethical behavior
- Awareness and Application of **Business Planning Principles** (Entrepreneurial IPRO project teams)

Required Text or Reading Materials

(1) *The Seven Layers of Integrity*. Jones, George P. and Ferrill, June. 2006. Authorhouse. ISBN 1-4208-6684-2.

(2) *The Ten Faces of Innovation*. Tom Kelly, with Jonathan Littman, 2005. Doubleday. ISBN 0-385-51207-4

Appendix C

COMARCH
INFORMATION TECHNOLOGY

COMPANY PRESS INVESTORS SUCCESS CAREER CONTACT

ERP Systems

Markets Products Services Integrated Office Customer Support News Where to Buy Case studies Partners

default / Products / CDN XL

System description

Sales Accounting CDN OFFICE ERP
CRM Reporting
Orders New Assets
Production Import
Service Downloads Admin/Infor

Microsoft
SQL Server™ 2005
Works with Windows Vista™

INFORMATION INTEGRITY
CDN XL is a multi-module, fully integrated ERP solution, intended for medium-size and large trading, manufacturing and service enterprises. Thanks to the built-in functionality, it ensures full support and automation of business processes in a company. The System allows on-line/off-line work of multibranch companies that often have a complicated system of document circulation. The software perfectly supports the work of salesmen, van sellers and enterprise branches. CDN XL enables using modern forms of e-trade by cooperation with EDI systems. It is also possible to rent the System, that is to use it over the Internet in ASP (Application Service Provision) model on the CDN Online platform. In this model data are stored in Comarch Data Centre (DC Comarch), built in accordance with the newest technology that allows only authorised access to the system.

CERTAINTY OF TOMORROW
CDN XL is a genuinely Polish product, adapted to the international and national business standards and to the regulations of the European Union. National versions of CDN XL, dedicated for particular countries are available. The System was designed by a team of highly-qualified designers, programmers and consultants, who form a strong substantial support for Customers together with Authorized Integrators of CDN XL. Each new version of the CDN XL solution includes the product adjustment to the changing regulations and develops the existing functionalities as well as creates new ones for increasing the ergonomics of work in the System.

FLEXIBILITY AND EFFECTIVENESS
This extensive functionality together with the option of parameterization and configuration ensure that the product can be adjusted to the Customer's individual and unique needs. The System's flexibility enables integration with external applications. On the basis of the many-year experience of ComArch and our Partners, ERP System Implementation Methodology was developed. The Methodology enables running the project according to a proven plan, and it guarantees the efficiency, optimization and reduction of the implementation time.

HIGH CAPACITY AND SECURITY
CDN XL operates in the client-server architecture. Thanks to the use of the modern technology - Microsoft SQL Server 2005 - it guarantees efficient, reliable work, data security and integration with the Microsoft Office applications. Additional tools give the option to extend the System with new functions. The certificate Designed for Microsoft BackOffice also proves the uniqueness of the solution.

Designed for
Microsoft BackOffice®

Microsoft SQL Server 2005

XL SIZE SUCCESS
Work automation and minimizing risk of mistakes in operations performed on large sets of data,
Optimization of the enterprise resources, performance control and improvement,
Savings on time and costs, thanks to entering data into the System once only.

Telecommunications
Finance & Banking
Enterprises

Contact our Consultant

MORE>

Data Migration Tool for CDN XL

Comarch - System description

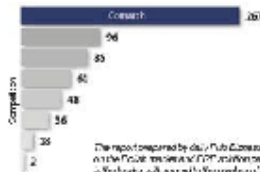
<http://www.comarch.com/cdnen/Products/CDN+XL/>

Up-to-date information from particular areas of the enterprise (company assets, costs, income, etc.) in any configuration and with a selected level of detail.

The CDN XL solution is used by over 1500 companies all over Poland. As results from the report about Polish ERP solutions market in 2004 published 26th January 2005 by a daily Puls Biznesu, Comarch company is the market leader with regard to the number of new contracts (customers). As confirmed in PB report, over 267 new CDN XL contracts were signed in 2004.

The most willingly bought ERP system

By IDC report: Polish ERP Market in 2004



The report prepared by daily Puls Biznesu 26.01.2005 16:05. Released on the Polish ERP market in 2004. The report is available in Polish, English, German, Ukrainian and Slovak. The report is available at <http://www.comarch.com/cdnen/Products/CDN+XL/>.

Dowiedz się więcej. Skontaktuj się z nami dzisiaj >>

Vertical Portals: Telecommunications | Finance & Banking | Government | Enterprise | ERP Systems
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