

**Robert Reinhardt**  
**List of software projects I was involved with**

This list presents various projects that I worked on and learned from. It shows:

1. very broad range of application areas;
2. broad range of my roles: from the developer to the designer, consultant supervisor and project manager;
3. some recent projects are still quite technical – I like to be in touch with present technologies.

This list is **not exhaustive** (there are gaps for several years); it is **quite incomplete** and **very unbalanced** (three year full time projects are formatted the same as some weekend pet projects). It was compiled from bibliography, old tapes, CDs and personal memory in 2004 and (occasionally) updated later.

<i>Timeframe</i>	2011/12
<i>Project</i>	<b>Project management of Cosylab work at ITER CODAC Core System Engineering</b>
<i>Partners</i>	ITER Organization, Cosylab, Pivot
<i>My role</i>	Management of the customer relations and internal group management in Cosylab for the work on CODAC Core System Engineering at ITER. Project areas: linux driver development, packaging & releases, developer support, QA, trainings. Extent of work approx 5 persons over 3 years. No actual software done by me personally.
<i>Environment, tools &amp; technologies</i>	linux RHEL, maven, EPICS, CSS, ITER specific SDD, linux device drivers for National Instruments boards
<i>Results</i>	CODAC Core system V3.0 was released in Feb 2012, linux device drivers for NI 6529 and NI sync were developed, support for 30+ demanding customers ongoing, trainings in ITER performed by Cosylab

<i>Timeframe</i>	2010
<i>Project</i>	<b>An opensource based web based survey system used in PPlane project</b>
<i>Partners</i>	Airnet, Israel Aerospace Industries, ITG Israel
<i>My role</i>	Implementation of the LimeSurvey open source system, some add-on modules for data analysis and logging
<i>Environment, tools &amp; technologies</i>	PHP, perl
<i>Results</i>	The system was used in the PPlane project to conduct several surveys

<i>Timeframe</i>	2009
<i>Project</i>	<b>Route planning/presentation web based software</b>
<i>Partners</i>	Pivot, Cavok European Airtours
<i>My role</i>	Implementation of a small route planning and presentation software to be used in presentation of self-fly airtours
<i>Environment, tools &amp; technologies</i>	PHP, perl
<i>Results</i>	The system is used at the cavok-airtours web site

<i>Timeframe</i>	2009
<i>Project</i>	<b>Initial redesign of the Beam Delivery Control System</b>
<i>Partners</i>	CosyLab, IBA Belgium, Pivot
<i>My role</i>	A redesign and re-implementation of the Beam Delivery Control System was planned by CosyLab for IBA for their Proton Therapy System. My role was project management within CosyLab in the initial phase, including understanding the functionality of the present system, complete system architecture and gathering customer requirements and use cases. No actual software done by me personally.
<i>Environment, tools &amp; technologies</i>	Java, maven, spring, XML, ...
<i>Results</i>	The project is still waiting the customer's order (budget); some minor parts were implemented by 2010 but without my involvement.

<i>Timeframe</i>	2009
<i>Project</i>	<b>Presentation of GPS tracks in Google Earth and Google Maps</b>
<i>Partners</i>	Pivot, S5-MMT, Airnet
<i>My role</i>	Design and implementation of the functionality.
<i>Environment, tools &amp; technologies</i>	PHP, perl
<i>Results</i>	The system is used at the S5-MMT web site

<i>Timeframe</i>	2006-2008
<i>Project</i>	<b>A GPS / GSM-GPRS based vehicle tracking system</b> for tracking and support of a fleet of agricultural machines (tractors and attached tools, dusting planes)
<i>Partners</i>	Pivot, Slorom, Xenya,
<i>My role</i>	Design of the the system architecture, implementation of data capture and web data presentation system, specification of the mobile unit firmware, specification and organization of the geo-data.
<i>Environment, tools &amp; technologies</i>	python, ruby, mySql, perl, Wavecom GenLoc31e module, Google Earth
<i>Results</i>	The system is in test run and deployed on an initial number of vehicles (5-10)

<i>Timeframe</i>	2006
<i>Project</i>	<b>Web interface &amp; reporting for a Warehouse management system</b> Logistics information system in Atlantic Zagreb
<i>My role</i>	I was the project manager of this implementation project of the Aldata Solution's G.O.L.D. Stock system; a late project specification change decision called for a "quick and dirty" implementation of an interface between level 3 commercial system and the warehouse management system. I implemented part of the interface functionality and complete web front-end to the interfaces and some other functions of the warehouse management system.
<i>Partners</i>	Aldata Solution Ljubljana, Atlantic Trade Zagreb
<i>Environment, tools &amp; technologies</i>	perl, Oracle PL/SQL, proC, java
<i>Results</i>	System in production

<i>Timeframe</i>	2005
<i>Project</i>	<b>A demonstrator for Self-voice-mail service</b>
<i>My role</i>	I designed and implemented a demonstrator system for authentication, voice conversion, e-mail delivery, web front-end and maintenance of the system (all but voice capture itself).
<i>Partners</i>	Xenya, Pivot, Mobitel
<i>Environment, tools &amp; technologies</i>	php, perl, C
<i>Results</i>	Successful demo, the system was later implemented under the integrated portal in Mobitel.

<i>Timeframe</i>	2004
<i>Project</i>	<b>WINDECT, Wireless Local Area Network with Integration of Professional-Quality DECT Telephony, a FP6 Specific Targeted Research Project</b>
<i>Partners</i>	Ascom Switzerland, Winfinity Berlin, IHP Frankfurt/Oder, University of Manchester, ETH Zurich, J. Stefan Institute Ljubljana
<i>My role</i>	Work package 4, development of a Human Computer Interface
<i>Environment, tools &amp; technologies</i>	python / gtk, execution environment: Windows, Linux, iPAQ, sockets
<i>Results</i>	successful integration

<i>Timeframe</i>	2003 – 2010
<i>Project</i>	<b>Sailing Club MIPC web site</b> Design and maintained of a web site of the sailing club MIPC. It includes some regatta entry forms, regatta scoring and other active interfaces. One of the modules also includes SMS notifications of the regatta scores.
<i>Partners</i>	JK MIPC
<i>My role</i>	I personally designed and maintained the web site together with all applications on this site up until mid 2006. I also did most of the pre-press editing of the printable material (images & texts).
<i>Environment, tools &amp; technologies</i>	perl, php, mySql, java, xml, ...
<i>Results</i>	used to support at least one major regatta each year and to provide handicap scoring for the club's yachts for all regattas in the competition season; needs a renewal

<i>Timeframe</i>	1999-2000
<i>Project</i>	<b>DF2001 a fifth generation of the accounting software</b>
<i>Partners</i>	Aster, Jestvina Koper, Magistrat International, DTP Poland, AKTRP, Central bank of Bosnia Herzegovina
<i>My role</i>	Architectural design, supervision, marketing.
<i>Environment, tools &amp; technologies</i>	Oracle, PL/SQL
<i>Results</i>	The new generation was never fully implemented; it was used by several customers as an incomplete product. The product was marketed as G.O.L.D. Financials but it was abandoned when Aldata and Aster were split into different companies. The system in its modified version is still in use at Central bank of Bosnia & Herzegovina and at DTP Poland (status 2010).

<i>Timeframe</i>	1999
<i>Project</i>	<b>POS interface to G.O.L.D</b>
<i>Partners</i>	Aster, Jestvina Koper
<i>My role</i>	I was managing the G.O.L.D. implementation project in Jestvina Koper that included G.O.L.D. modules Central, Shop, Stock. Within this project I personally developed a large set of interface modules for interfacing POS equipment and a set of web based reports.
<i>Environment, tools &amp; technologies</i>	Oracle, PL/SQL, perl
<i>Results</i>	The modules were customer specific and they were used as long as the system was used by the customer (they were acquired by Mercator).

<i>Timeframe</i>	1998
<i>Project</i>	<b>DFP, A web based datawarehouse and document management system for DF;</b> A data warehouse and reporting system for financial, accounting data was implemented for several customers with a copy of data from the legacy financial-accounting system DF to Oracle. For my personal use as the manager of Aster, I developed a web based interface to this data warehouse together with document imaging/archival system.
<i>Partners</i>	Aster, Aldata
<i>My role</i>	Architectural design, specification, development, implementation
<i>Environment, tools &amp; technologies</i>	Oracle, PL/SQL, perl
<i>Results</i>	Extensively used internally in Aster and later in Emona Obala and Aldata Slovenia.

<i>Timeframe</i>	1997-2001
<i>Project</i>	Many small <b>office automation projects</b> in Visual basic for Applications embedded in MS Word or MS Excell
<i>Partners</i>	Aster
<i>My role</i>	Identify the need, design, develop, test & deploy
<i>Environment, tools &amp; technologies</i>	Visual basic, MS Office
<i>Results</i>	Extensively used internally in Aster.

<i>Timeframe</i>	1991-1993
<i>Project</i>	<b>VP, a comprehensive Wholesale support system</b> for maintenance of stock, valuation of stock, invoicing, etc. with support for flexible business model, including consignment stock on input and output, customs support, etc.
<i>Partners</i>	Aster, Emona Obala Koper
<i>My role</i>	Architectural design of the system; implementation and maintenance was done by coworkers in Aster and my role in that was minimal; later on, a data warehousing system was implemented to hold the reporting data for VP (my role minimal), but my DFP is based on that data warehouse.
<i>Environment, tools &amp; technologies</i>	OpenVMS, pascal, assembly
<i>Results</i>	Successful implementation in two installations, last installation was shut down (changed to G.O.L.D.) in 1999.

<i>Timeframe</i>	1989-1991
<i>Project</i>	<b>A financial accounting system DF</b>
<i>Partners</i>	Aster, Emona Obala Koper
<i>My role</i>	Architectural design of the system (my fourth redesign of an accounting system – it was so good I would not change much today), development team management, implementation of some functional modules, namely data structure organization, quad arithmetics, ...
<i>Environment, tools &amp; technologies</i>	OpenVMS, pascal, assembly
<i>Results</i>	The system was successfully used in 13 production installations in various companies; last implementation was shutdown in 2006

<i>Timeframe</i>	1986-1988
<i>Project</i>	<b>An accounting system for SME V3</b> – see below for more information at V1 This was a third redesign of the system, a downscale.
<i>Partners</i>	none, customer Trgokooperant Maribor
<i>My role</i>	Full design and implementation of the system, customer support, system integration
<i>Environment, tools &amp; technologies</i>	PDP-11, RT11, pascal, assembly
<i>Results</i>	The system was successfully used in one installation for several years.

<i>Timeframe</i>	1985-1986
<i>Project</i>	<b>An accounting system for SME V2</b> – see below for more information at V1 This system was redesigned to have the same functionality but run on a MicroVAX. It was more integrated, had much more structure (like common display driver, forms manager, etc).
<i>Partners</i>	Alojz Černe; customer Železopromet Ljubljana, later Trgokooperant Maribor
<i>My role</i>	I led the team of two in the redesign effort, designed the whole system and programmed half of the system.
<i>Environment, tools &amp; technologies</i>	OpenVMS, pascal, assembly
<i>Results</i>	The system was successfully used in two production installations until the concept of such company died in 1988.

<i>Timeframe</i>	1985
<i>Project</i>	<b>An accounting system for SME V1</b> This system was targeted to a special type of small business organizations that were a organizing production of many small producers. The idea and business driver was that this kind of company (obrtna zadruga) exploited a hole in the sales tax law: raw materials given to some private subcontractor were tax exempt. Such organizations had several hundred private subcontractors (members) and they handled all paperwork for them. Our software was developed to fully support such businesses. This included general ledger, accounts receivables and payables, fixed assets, complex materials flow through cooperative production, salaries, ...
<i>Partners</i>	Drago Brank; customer Metalna, Jesenice na Dolenjskem
<i>My role</i>	Partial design of the system, development of approximately half of the modules, customer support, ...
<i>Environment, tools &amp; technologies</i>	PDP-11 RT11, pascal, assembly
<i>Results</i>	The system was successfully used by one such organization.

<i>Timeframe</i>	1985
<i>Project</i>	<b>A device driver for PMP disk drives</b>
<i>Partners</i>	Jozef Stefan Institute
<i>My role</i>	I developed a disk device driver for a project called PMP (a single board PDP compatible computer – poor man's PDP); design, coding, kernel debugging & testing
<i>Environment, tools &amp; technologies</i>	PDP-11 RT11, assembly
<i>Results</i>	It was used on all produced systems (some 100 of them)

<i>Timeframe</i>	1984-1985
<i>Project</i>	<b>Warehousing support system</b> for Slovenijaes, a large (at that time) furniture manufacturer and trader. The project started with the design and specification phase in 1977, at the same time the warehouse construction planning was initiated. The implementation of the system came into a crisis in mid 1984, when the system was architecturally redesigned and a new development group (15 engineers) was formed. The system included all (also real time) support for the warehousing technology and operations.
<i>Partners</i>	Jozef Stefan Institute, Slovenijales
<i>My role</i>	Project manager – led the group of 15 best people that were available at the JSI (and outside) at that time. The project run under scrutiny of the users and outside consultants as there was a pending lawsuit. By some estimates this was the largest and most intensive software development project at that time in Slovenia.
<i>Environment, tools &amp; technologies</i>	VMS, pascal, assembly
<i>Results</i>	Successful start in production in mid 1985, the system run with virtually no changes or support until 2000 for 15 years.

<i>Timeframe</i>	1983-1989
<i>Project</i>	<b>A set of VAX/VMS system management tools.</b> For the purpose of workload sharing, JSI, Iskra and Banka Slovenije teamed to form a pool of system engineers that were able to work at all sites. In the course of standardization of system management, we gradually developed a set of tools (mostly scripts).
<i>Partners</i>	Mark Martinec, Henrik Krnec, Bob Marčan, and others at Jozef Stefan Institute, Iskra and Bank of Slovenia
<i>My role</i>	I was acting VAX/VMS system engineer at the JSI and was doing my part of scripting, evaluation, standardization and testing.
<i>Environment, tools &amp; technologies</i>	VMS DCL, pascal, assembly
<i>Results</i>	This set of tools was later the basis for an Aster product VAXMAN that was deployed by Aster on more that 100 sites.

<i>Timeframe</i>	1983
<i>Project</i>	<b>Rasterizer for the GKS graphic library</b>
<i>Partners</i>	Mark Martinec and others at Jozef Stefan Institute
<i>My role</i>	I reimplemented and hand optimized a kernel image rasterizer that was used as the core of a GKS graphics library for all devices that needed raster output (like matix printers).
<i>Environment, tools &amp; technologies</i>	assembly, some 5000 lines of VAX code
<i>Results</i>	By hand optimizing the code I achieved approximately 50 fold boost in performance.

<i>Timeframe</i>	1981
<i>Project</i>	<b>Demonstration of phototypesetting system.</b> JSI has completed a comparative study of the phototypesetting systems for the association of printing industry in Slovenia. There was an obvious business opportunity to be part in the process of the renewal of the software solutions that were in use at that time; however we had to overcome the credibility problem. So we decided to make a demonstration of our capabilities and hacked (in the noblest sense of this word) a system that we were able to show as almost complete system. We developed a comprehensive text management solution, some of the page composition functionality and all the hardware/software glue so that we were able to integrate the demo system into a number of then existing typesetting solutions. All this in a single month.
<i>Partners</i>	A group at JSI Computer Science department
<i>My role</i>	Project management, integration works
<i>Environment, tools &amp; technologies</i>	VAX, PDP, a lot of other hardware boxes (real and faked) pascal, assembly
<i>Results</i>	Successful demonstration, no business success

<i>Timeframe</i>	1975-1978
<i>Project</i>	<b>LISP Programming System</b>
<i>Partners</i>	
<i>My role</i>	I maintained and developed extensions for a LISP interpreter/compiler for a LISP system that was developed at the University of Texas, Austin.
<i>Environment</i>	Assembly language CDC Cyber 72
<i>Results</i>	The system was used by several researchers for their development environment.

<i>Timeframe</i>	1975
<i>Project</i>	<b>A Unix device driver for serial line board</b>
<i>Partners</i>	Jozef Stefan Institute
<i>My role</i>	We installed the first Unix system on PDP-11 but it did not have the driver for the serial line MUX board. First joys of hardware compatibility under Unix. A small project but significant for my first exposure to Unix.
<i>Environment, tools &amp; technologies</i>	PDP-11 Unix, C
<i>Results</i>	Driver was working but Unix was not really used seriously at that time.

<i>Timeframe</i>	1976-1978
<i>Project</i>	<b>A system to support organization of Symposium Informatica</b>
<i>Partners</i>	J. Stefan Institute
<i>My role</i>	Together with several other students we maintained a system that supported "Congress organization": referral procedures, production of proceedings, participants lists, hotel reservations, registration of participants, scheduling, etc.
<i>Environment</i>	Fortran on PDP 11
<i>Results</i>	Each year we organized the symposium; the system was a good support, although for our own use only (today a single Excel would do a better job)

<i>Timeframe</i>	1973-1974
<i>Project</i>	<b>Methodological Software</b> , a large fundamental research project in software engineering and compiler construction; a simple Compiler-compiler
<i>Partners</i>	J. Stefan Institute, Anton P. Železnikar, many others
<i>My role</i>	A system to work with context free grammars, test for many attributes, test for LL(1), iterative language modification to make an LL(1) grammar, produce a recursive descent language parser, ...
<i>Environment, tools &amp; technologies</i>	Fortran, assembler, CDC Cyber 72
<i>Results</i>	REINHARDT, Robert, ŽELEZNIKAR, Anton P. Preprost sistem za pisanje prevajalnikov. V: <i>Proceedings of the 9th Yugoslav international symposium on information processing Informatica 74 : Bled, oktobra 1974.</i> [COBISS-ID 6976807]

<i>Timeframe</i>	1973
<i>Project</i>	<b>Hashing algorithms</b>
<i>Partners</i>	J. Stefan Institute, Vladimir Batagelj
<i>My role</i>	Implementation of the testbed and execution of tests
<i>Environment, tools &amp; technologies</i>	Fortran, CDC Cyber 72
<i>Results</i>	BATAGELJ, Vladimir, REINHARDT, Robert. Metode iskanja po tabelah. V: <i>Proceedings of the 8th Yugoslav international symposium on information processing Informatica 73 : Bled, 1.-5. oktobra 1973.</i> Ljubljana: ZSOOP, 1973, str. a20/1-8. [COBISS-ID 8345177] Based on this and on his further original research Vladimir Batagelj has published a paper Communications of the ACM.