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From hard-coded to customizable

Must haves of a really flexible application

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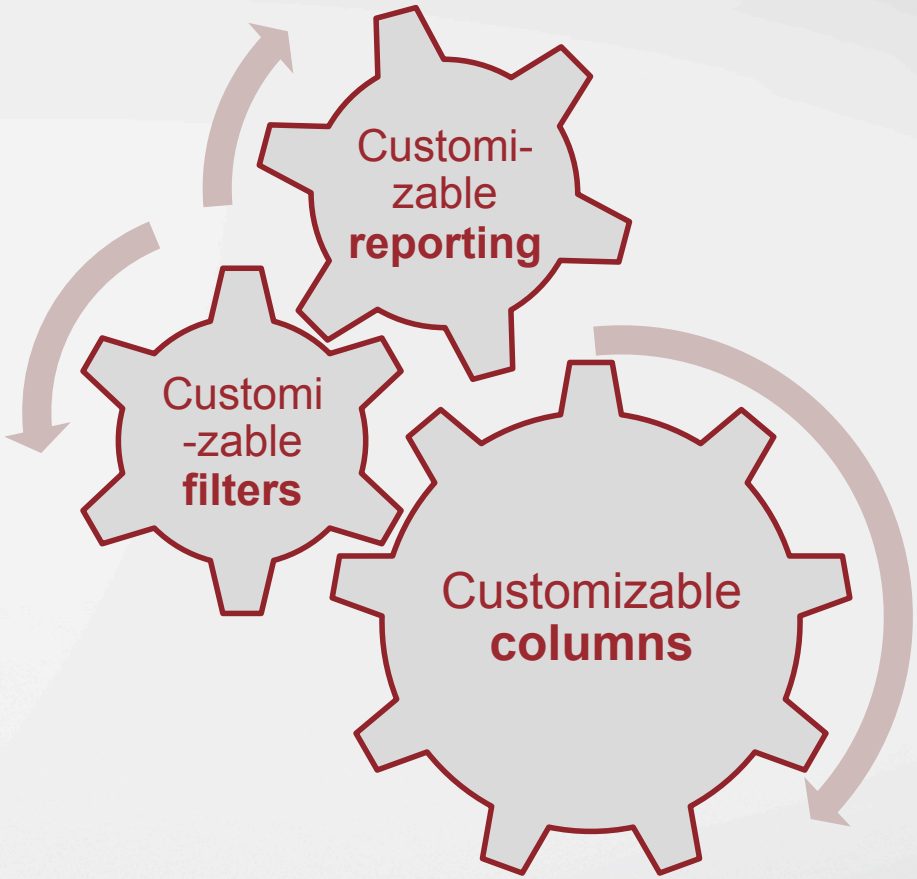
JDD 2011 Kraków

Agenda

- XTRF
- Software flexibility
- Ideas that work
  - Customizable columns
  - Virtual columns
  - Customizable filters
  - Manageable views
  - Customizable reporting
  - Charts
- Summary



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The product

Global management software for translation agencies and localization departments

- Project
  - Start: 2006
  - Domain expert + IT expert + Marketing expert
- Technology
  - Jboss AS, Hibernate, Spring, Velocity, Eclipse Birt, Jboss Seam, RichFaces and others (150 jar's…)
- Distribution model
  - single „ear" file
  - licence server
  - On premises & SaaS
- Modules
  - Project management & workflow
  - CRM
  - Invoicing
  - BI reporting
  - more…

Software Flexibility

The ability of software to change easily in response to different user and system requirements.

Developer perspective ≠ Customer perspective

Software Flexibility

Developer/Architect perspecitve

- Software modularity (multi-layerd)
- Component/Service orientation (loosely coupled)
- Design patterns (IoC and dependency injection in particular)
- JDBC/JPA – no database vendor lock-in, power of ORM
- Just COOL

Customer perspective

- **Cool only if it increases the business value**
- Much more functionally oriented ☺

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Going International

- Multiple languages of UI
  - translation of properties (Strings externalization ☺)
- Data formatting
  - Data, time (time zones), numbers and currency values
- Data localization
  - Dictionary values (country names, language names)
  - Email templates
  - Document templates (Invoices, POs, etc.)
- Different ways companies work
  - Project workflows,
  - Integrated, cooperating software

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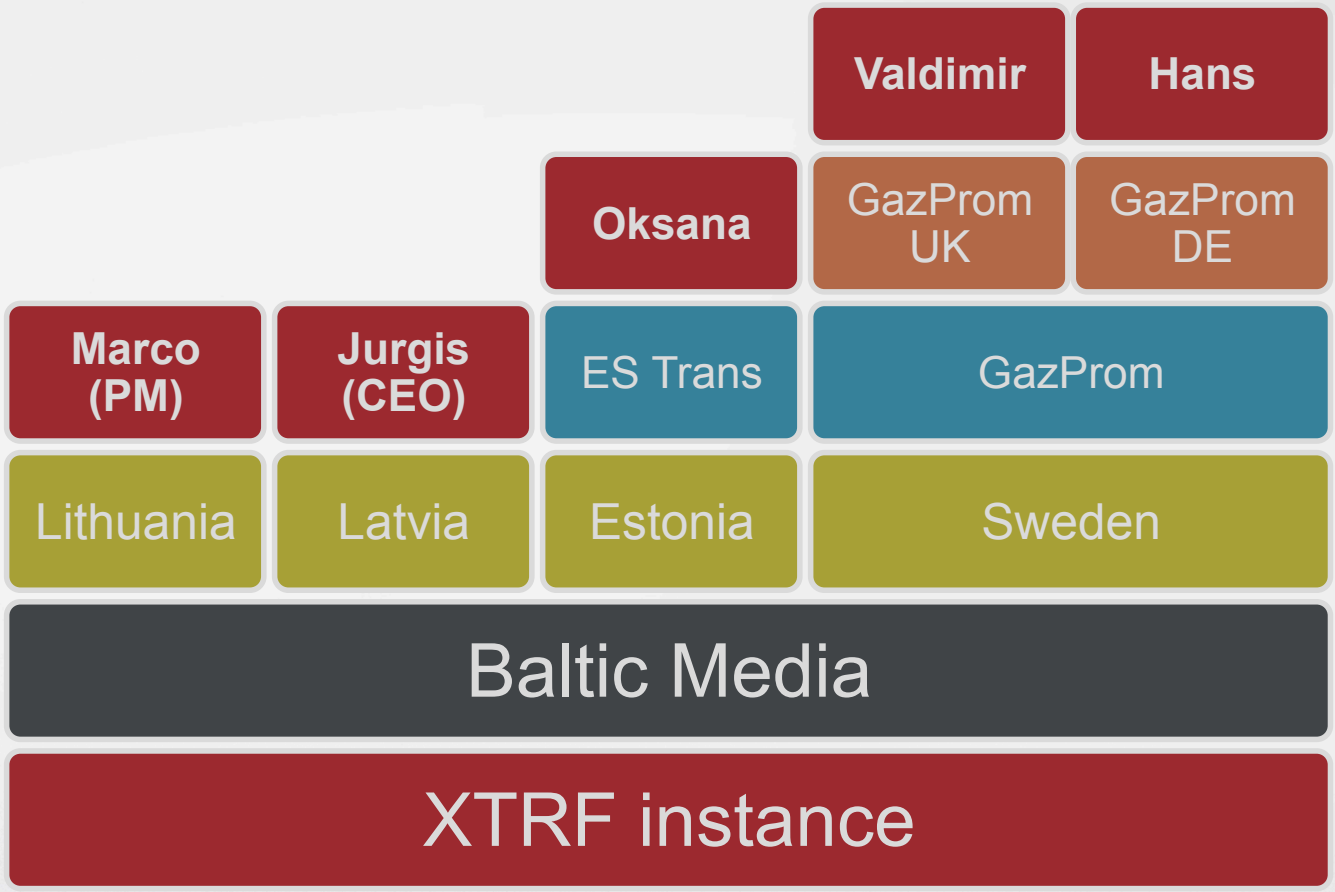
Users' perspectives



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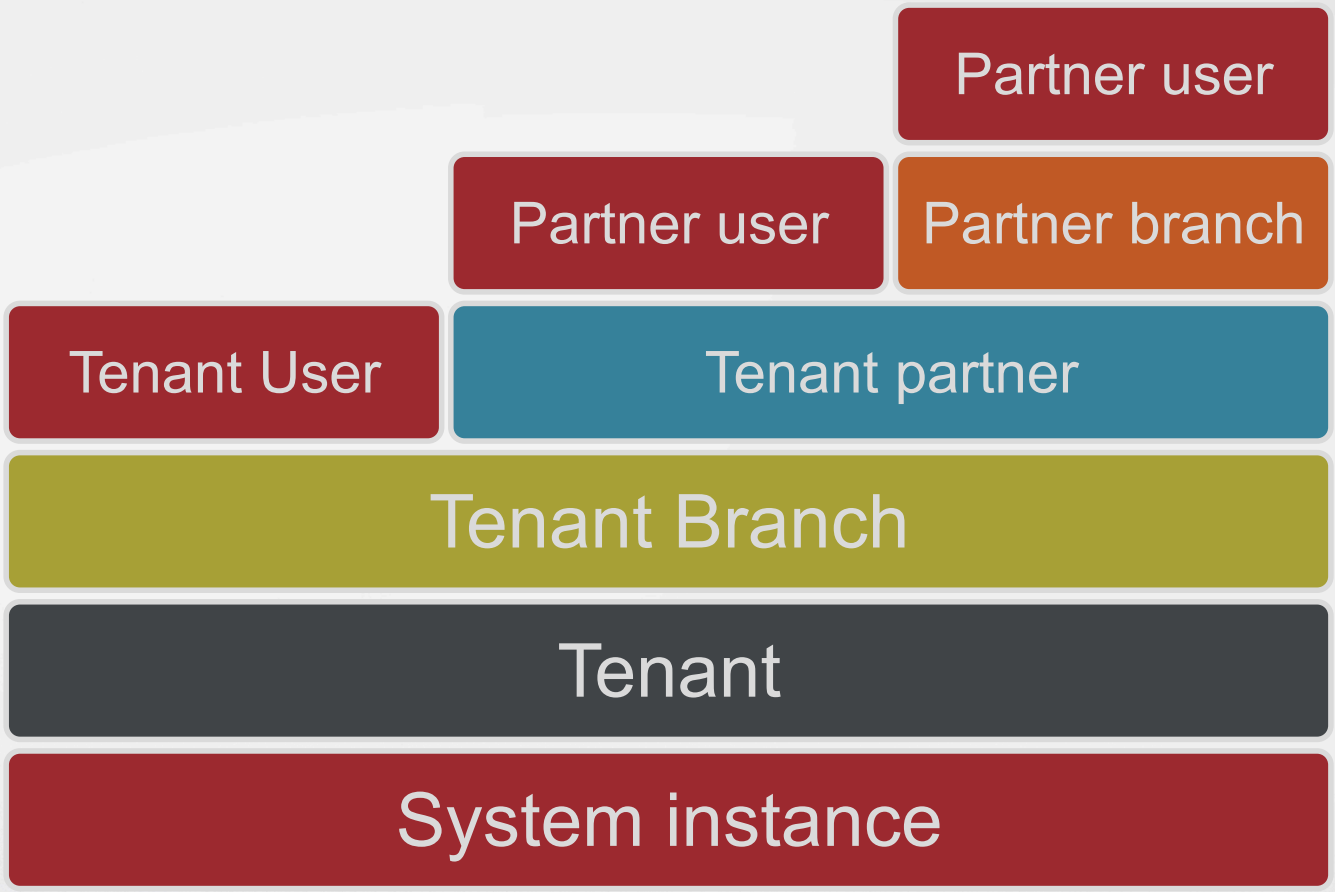
Scope for flexibility



Customer requirements (2007)

Project list · 2 items

ID number	Name	Total cost	Total agreed	Languages	Currency	Deadline	Edit	Delete
2011/2	dddddd	0,00 $	0,00 $	AB » AR, AB » HY, AB » SQ, AB » AM,	American Dollar [$]	2011-11-05		
2011/1	test	0,00 $	0,00 $	AB » AY,	American Dollar [$]	2011-11-05		

Additional columns in project browse

- (C1) customer address
- (C2) language combination,
- (C3) amount. PM name, email,
- etc

CEO:

It is a very important customer !

We must do it for him (only this one time…)

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Never allow for
‚per customer code branching'
unless you want to have multiple
independent applications soon.

Make flexibility your
key functional requirement
?

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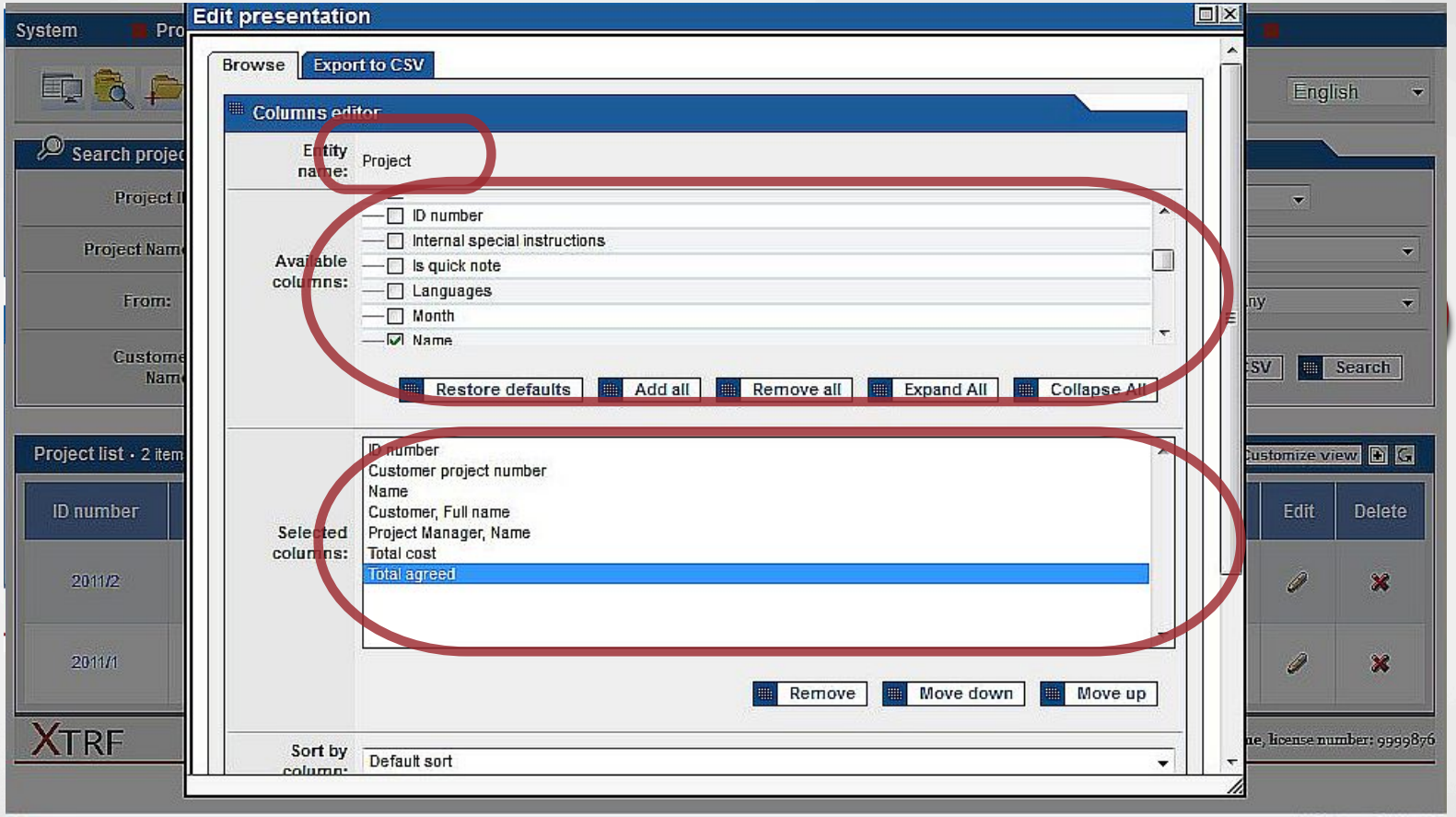
Customizable columns (2008)



No very innovative but……

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Customizable columns (2008)

@CustomizableListElement

@CustomizableColumnFinalElement

@CustomizableColumnParentElement

```
@CustomizableListElement
public class Project {

    private ProjectStatus status;
    private Date deadline;
    private Customer customer;

    @CustomizableColumnFinalElement
    public ProjectStatus getStatus() {
        return status;
    }

    @CustomizableColumnFinalElement(formatter = ValueFormatter.DATE_AND_HOUR)
    public Date getDeadline() {
        return deadline;
    }

    @CustomizableColumnParentElement
    public Customer getCustomer() {
        return customer;
    }
}
```

```
@CustomizableListElement
public class Customer {

        private String name;
        private Country country;


        @CustomizableColumnFinalElement
        public String getName() {return name;}
        @CustomizableColumnFinalElement
        public Country getCountry() {return country;}
}
```

Simplified,
JPA annotations removed

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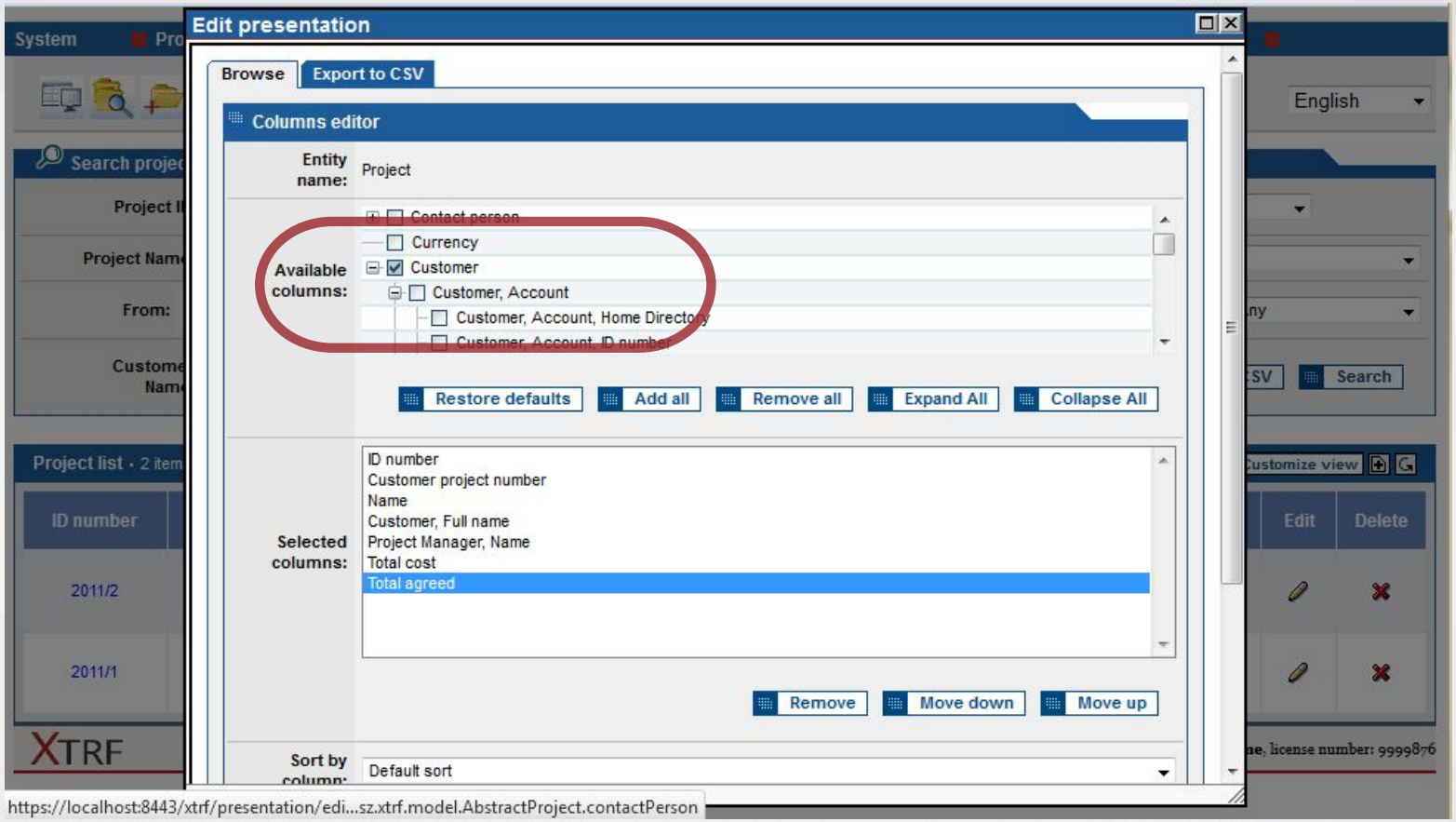
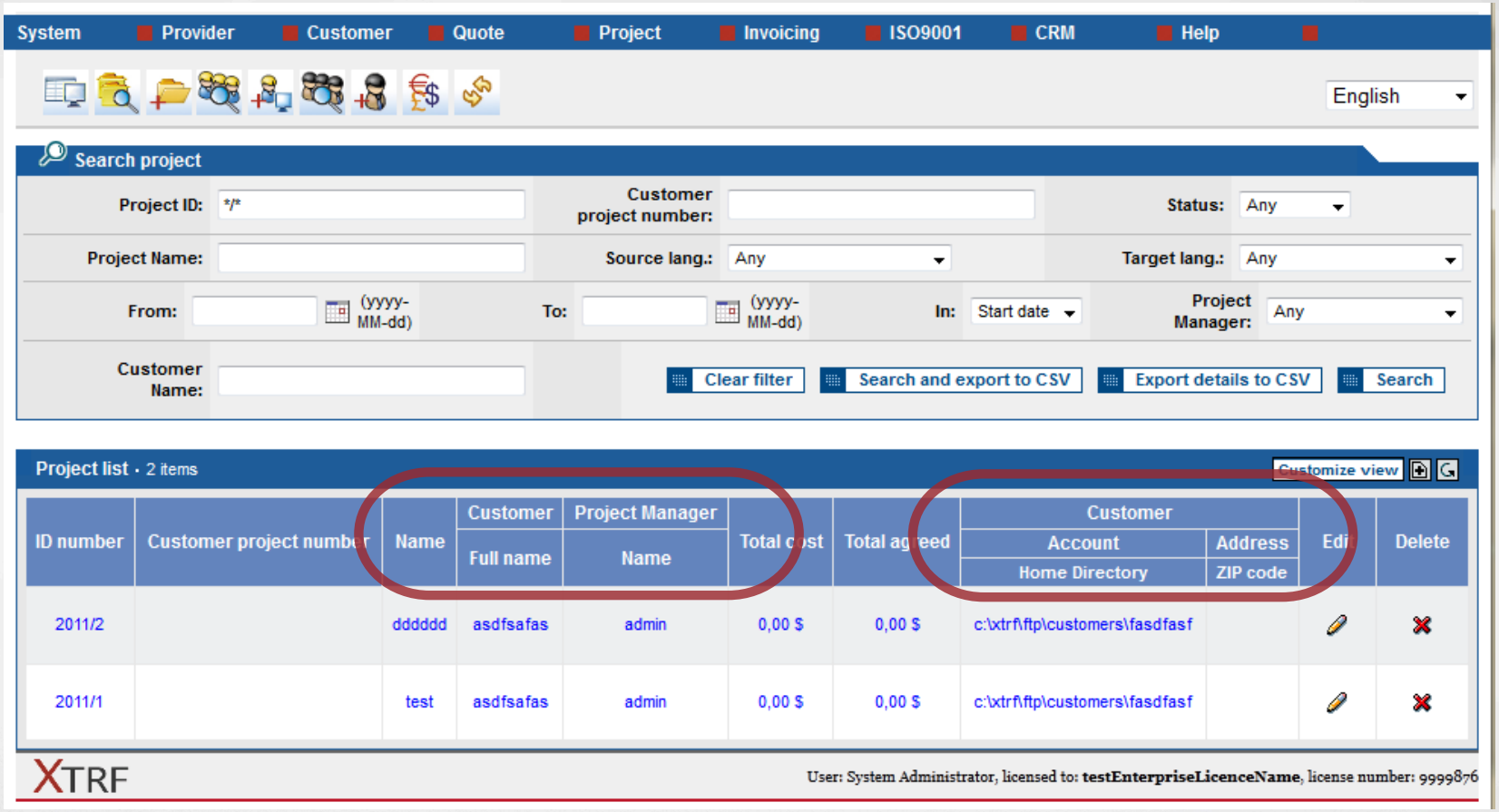
Customizable columns (2008)



Customizable columns (2008)



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Customizable columns

- Functionality
  - column selection based on the entire domain model
  - changeable column sequence
  - sorting
  - paging with definable number of rows
  - csv export
- Customizable for each individual user
- Default configuration

```
@CustomizableListElement
@CustomizableListDefaults( {
    @CustomizableListDefault(view = "quickNotesView", columns = { "idNumber", "notes", "customerProjectNumber",
            "name", "customer.fullname", "projectManager.displayName", "startDate", "deadline" }),
    @CustomizableListDefault(view = "", columns = { "idNumber", "customerProjectNumber", "name",
            "customer.fullname", "projectManager.name", "totalCostDisplay", "totalAgreedDisplay", "startDate",
            "deadline" }) })
public class Project {
```

- Consistent, easily maintainable code

The customer(s) opinion

Great, but…

Name	Address, street	Address, city	Address, country
GazProm	16 Nametkina St.	Moscow	Russian Federation
Google	2590 Pearl Street, Suite 100	Boulder, CO 80302	USA

we would prefer to have address in one column in two lines and some colours…

Name	Address
GazProm	16 Nametkina St., Moscow, Russian Federation
Google	2590 Pearl Street, Suite 100, Boulder, CO 80302, USA

Your customer is the ultimate judge of your solution

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Virtual columns

- Extends customizable tables' column meta-model with artificial column
- Definition includes:
  - localizable name
  - Velocity script exploiting domain model
  - html / raw mode
  - access role
- Available in each view (also as a sub element)
  - e.g. defined for customer but accessible in project browse
- Enables „collection attributes" access

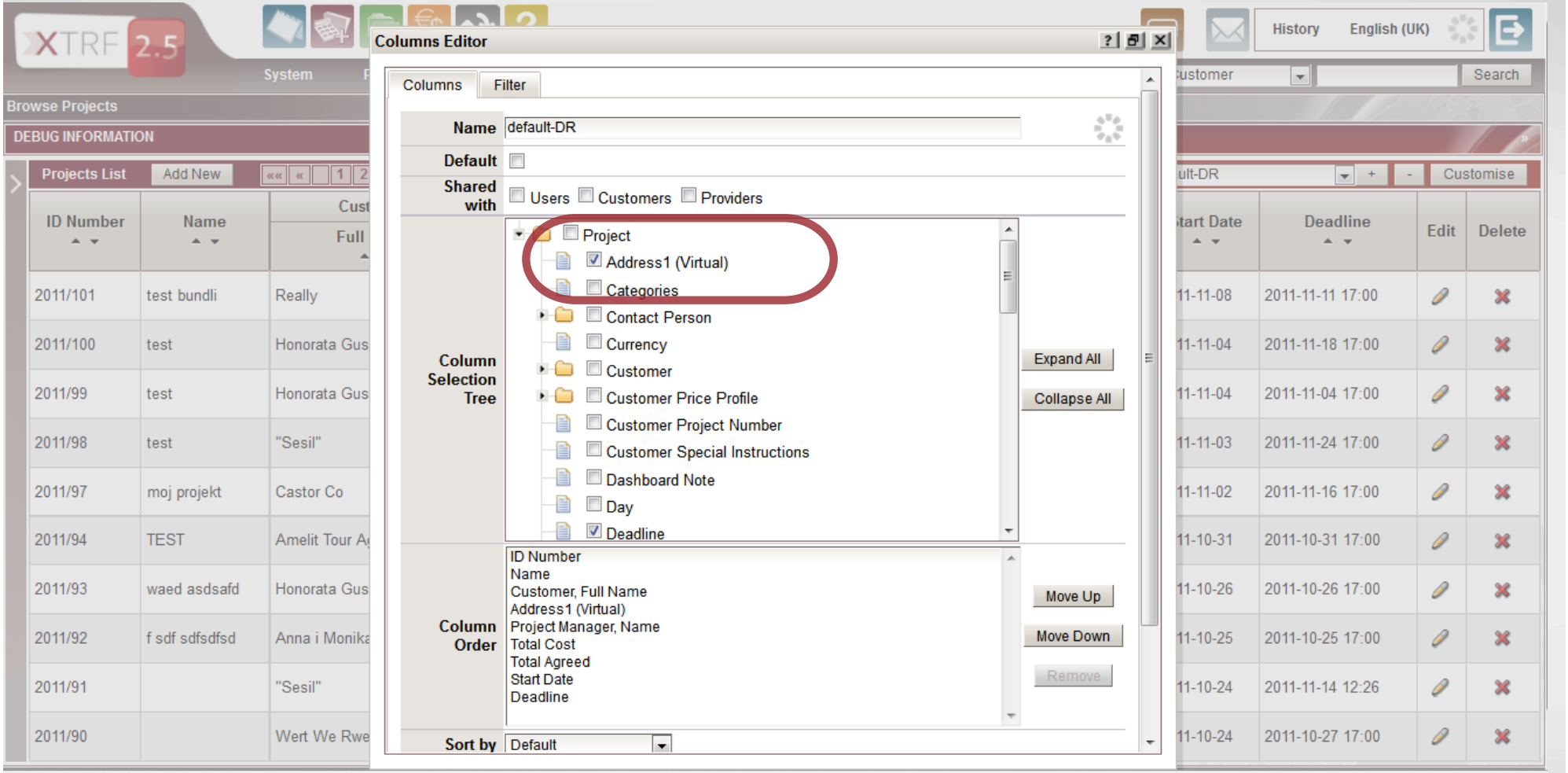
Virtual columns

A long time ago in a configuration far, far away....

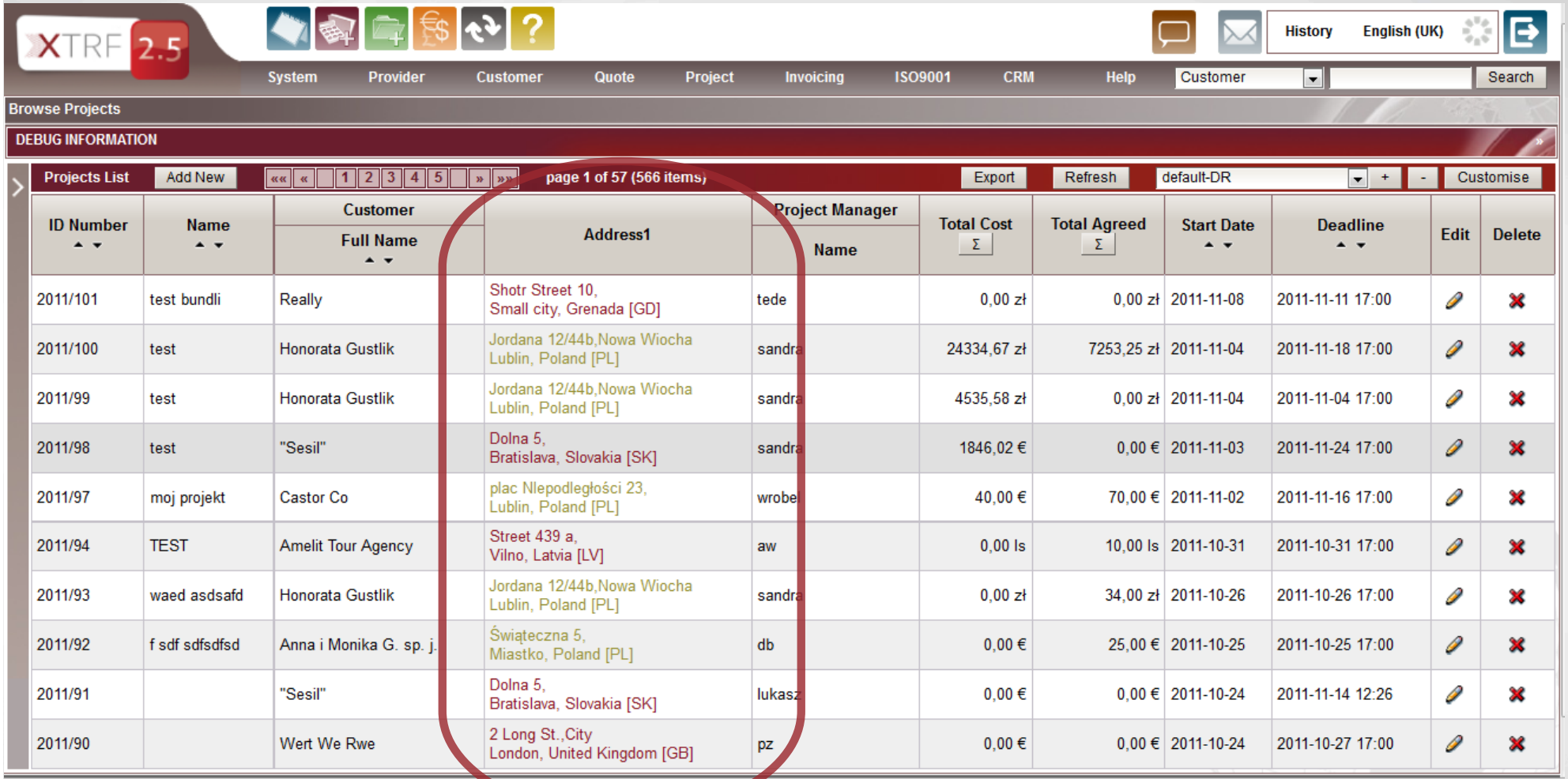
Class Name	Project
Name	Address1 *
Localised Name	Language: Polish; Localised Name: Adres; Edit; Delete Add Localised Value
Type	HTML *
Role Name	
Expression	

```
#set($country1 = "Poland [PL]")
#if(${this.customer.address.country} == $country1)
<font color ='#959134'>
${this.customer.address.address},
${this.customer.address.address2} <BR>
${this.customer.address.city},
${this.customer.address.country}
</font>
#else
<font color ='#881824'>
${this.customer.address.address},
${this.customer.address.address2} <BR>
${this.customer.address.city},
${this.customer.address.country}
</font>
#end
```

Virtual columns – result (2010)

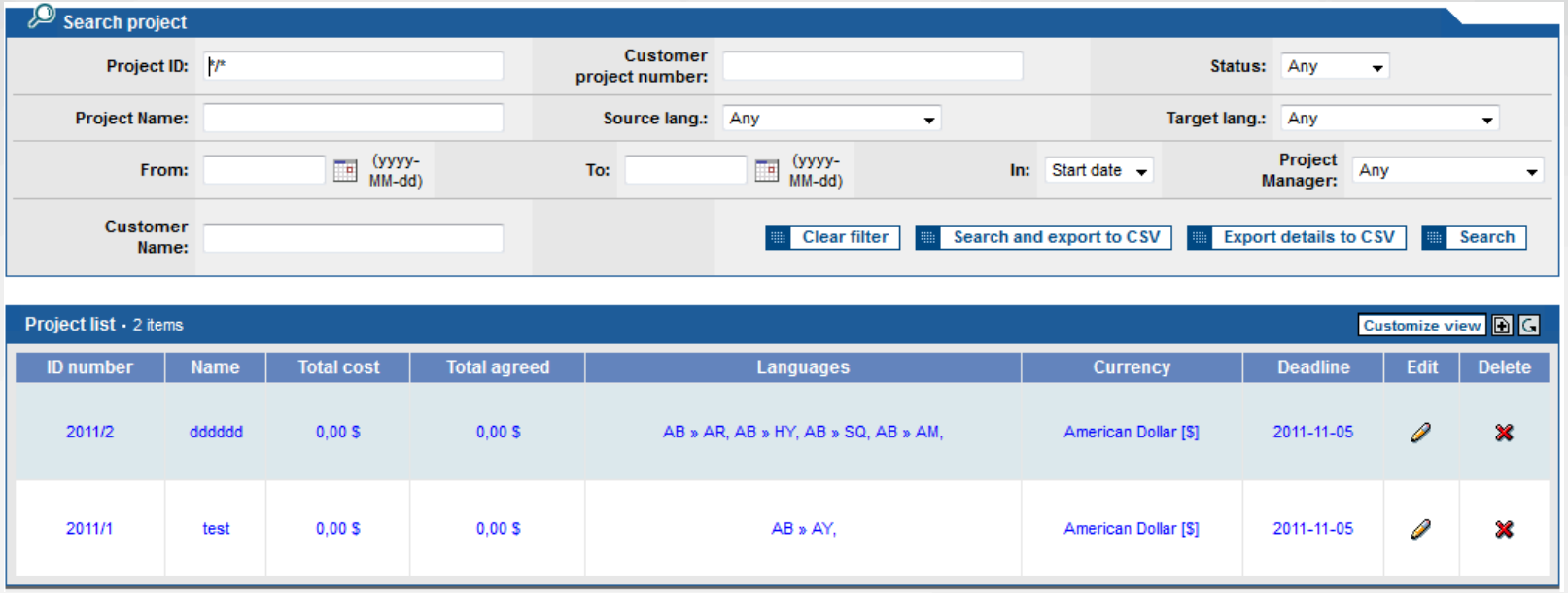


Virtual columns – result (2010)



ID Number	Name	Customer Full Name	Address1	Project Manager Name	Total Cost	Total Agreed	Start Date	Deadline	Edit	Delete
2011/101	test bundli	Really	Shotr Street 10, Small city, Grenada [GD]	tede	0,00 zł	0,00 zł	2011-11-08	2011-11-11 17:00		
2011/100	test	Honorata Gustlik	Jordana 12/44b,Nowa Wiocha Lublin, Poland [PL]	sandra	24334,67 zł	7253,25 zł	2011-11-04	2011-11-18 17:00		
2011/99	test	Honorata Gustlik	Jordana 12/44b,Nowa Wiocha Lublin, Poland [PL]	sandra	4535,58 zł	0,00 zł	2011-11-04	2011-11-04 17:00		
2011/98	test	"Sesil"	Dolna 5, Bratislava, Slovakia [SK]	sandra	1846,02 €	0,00 €	2011-11-03	2011-11-24 17:00		
2011/97	moj projekt	Castor Co	plac Niepodległości 23, Lublin, Poland [PL]	wrobel	40,00 €	70,00 €	2011-11-02	2011-11-16 17:00		
2011/94	TEST	Amelit Tour Agency	Street 439 a, Vilno, Latvia [LV]	aw	0,00 ls	10,00 ls	2011-10-31	2011-10-31 17:00		
2011/93	waed asdsafd	Honorata Gustlik	Jordana 12/44b,Nowa Wiocha Lublin, Poland [PL]	sandra	0,00 zł	34,00 zł	2011-10-26	2011-10-26 17:00		
2011/92	f sdf sdfsdfsd	Anna i Monika G. sp. j.	Świąteczna 5, Miastko, Poland [PL]	db	0,00 €	25,00 €	2011-10-25	2011-10-25 17:00		
2011/91		"Sesil"	Dolna 5, Bratislava, Slovakia [SK]	lukasz	0,00 €	0,00 €	2011-10-24	2011-11-14 12:26		
2011/90		Wert We Rwe	2 Long St.,City London, United Kingdom [GB]	pz	0,00 €	0,00 €	2011-10-24	2011-10-27 17:00		

Searching Criteria – Filters (2008)



- Hard to compose an attractive appearance
- Get broken with long name in some localizations
- Less and less space for results
- Ever-growing customers expectations
  - PM, customer (city, country), language, dates,….

Filtering insides

```java
public interface GenericFilterableService
        <E extends VersionedEntity, F extends GenericFilter<E>>  {

    List<E> getAll(final F filter) throws DataAccessException;
    List<Long> getAllIds(final F filter) throws DataAccessException;
    //more generic CRUD operations here
}
```

```java
public interface ProjectService extends
    GenericFilterableService<Project, ProjectFilter> {
    //more project specific methods here
}
```

```java
public class ProjectFilter implements GenericFilter<Project> {

    private String customerName;
    private Date startdateUpperLimit;
    private Date startDateDownLimit;
    private XtrfUser projectManager;
    // more fields and methods for storing filter data

    public CriteriaWrapper getCriteriaWrapper() {
        CriteriaWrapper criteriaWrapper = getCriteriaWrapper();

        criteriaWrapper.addIlikeAnywhereRestriction("customerName", customerName);
        criteriaWrapper.addBetweenRestriction("startDate", startDateDownLimit, startdateUpperLimit);
        criteriaWrapper.addEqRestriction("projectManager", projectManager);
        // lots of fields skipped
        return criteriaWrapper;
    }
}
```

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Filtering – the challenge

- Allow customer to define filter view
  - Fixed / default values
  - Hidden fields
  - Date limiters
  - Multi/single selects
  - Auto values
  - Limit number of results

- Reduce the implementation of filters to Filter's class **interface**
- Move all filters to the left for easy GUI composition

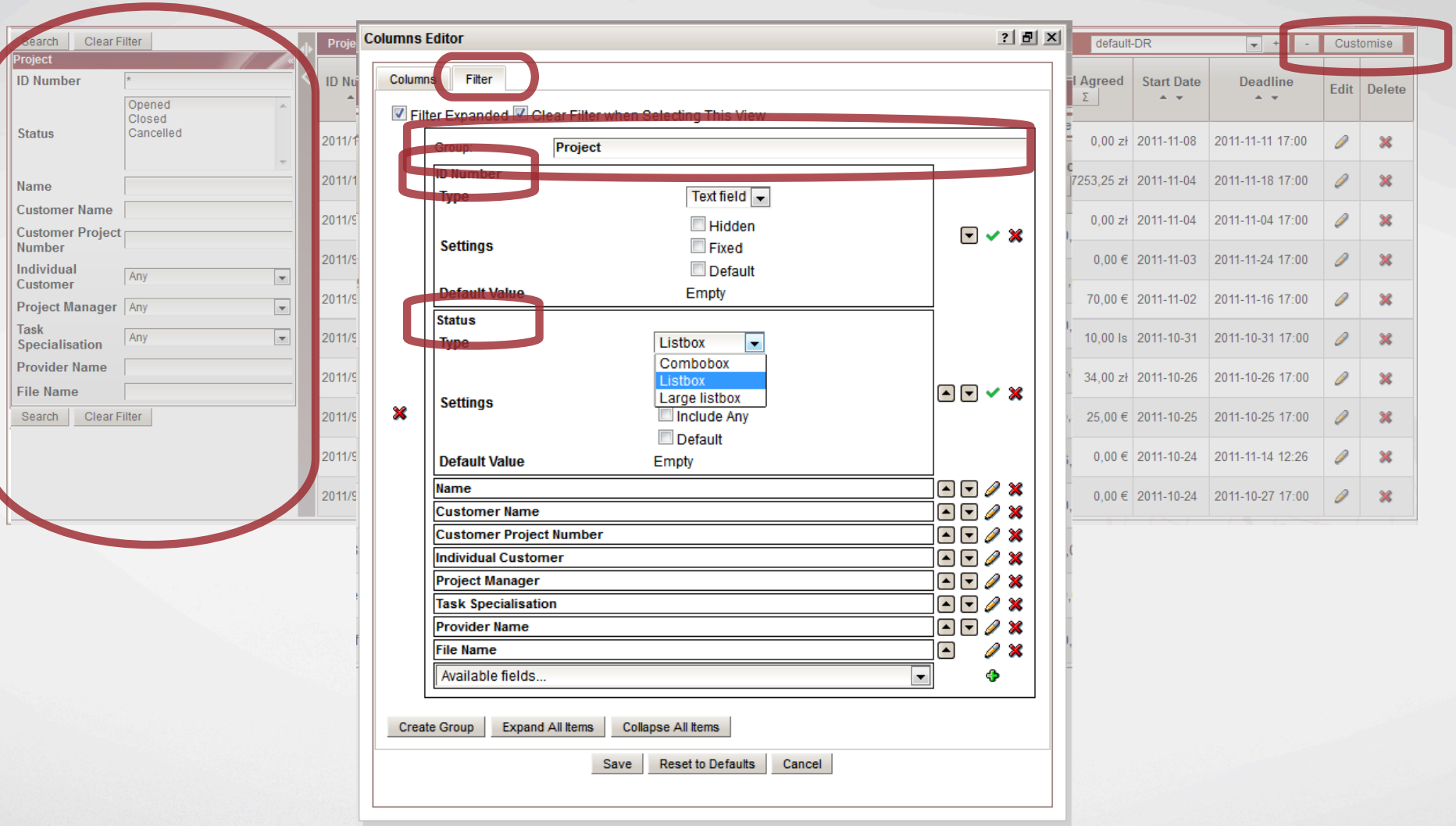
Filtering - solution

```java
public interface GenericFilter<E> {
    // some methods skipped
    Iterator<GenericProperty> iterator();
    PropertyContainer getPropertyContainer();
    CriteriaWrapper getCriteriaWrapper();
}
```

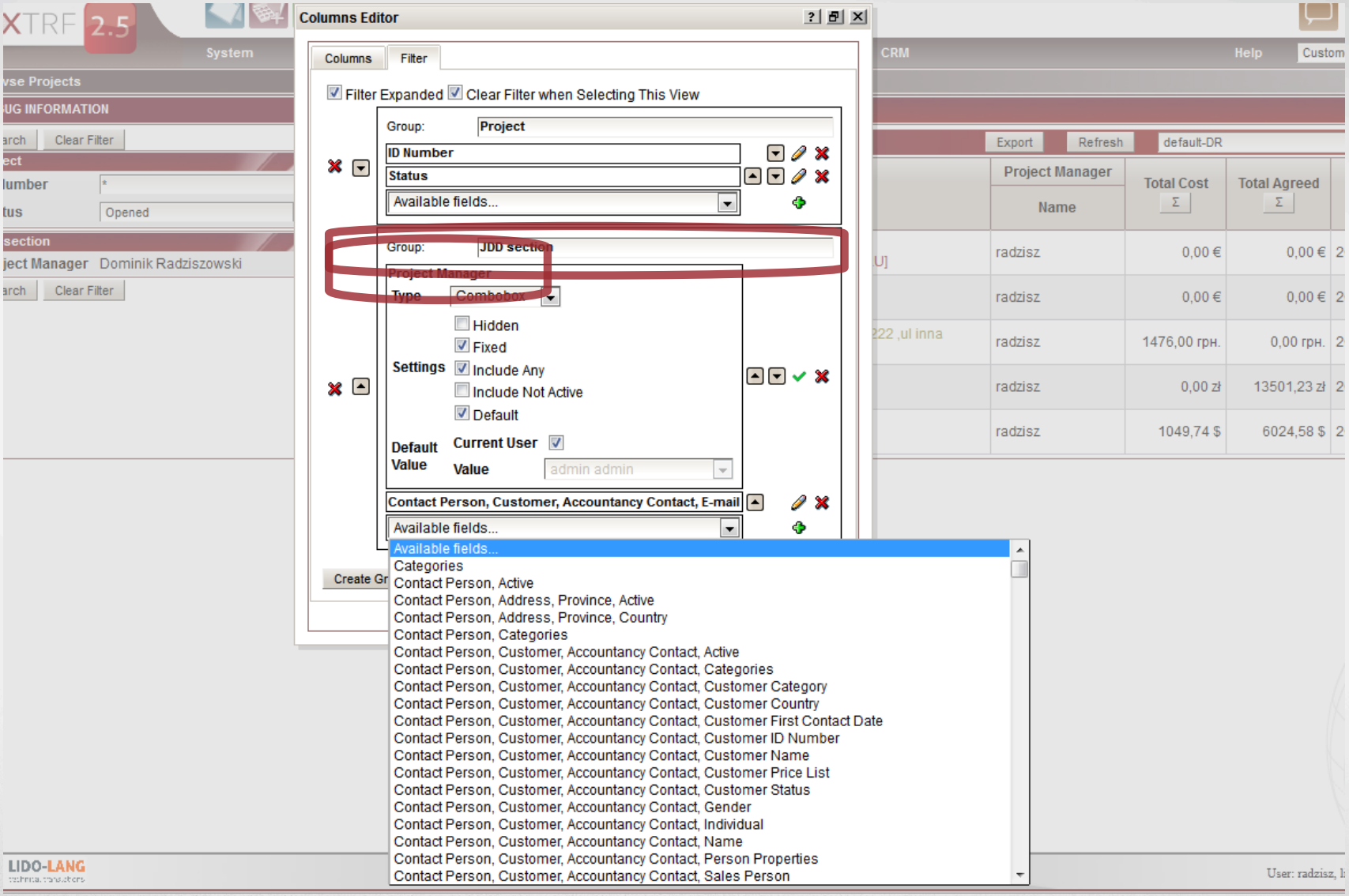
```java
@FilterDefaultViews(
        @FilterDefaultView({
            GROUP_PROJECT,
                "customerName",
                "projectManager",
            GROUP_START_DATE,
                "startDate",
                })
)
public interface ProjectFilter extends GenericFilter<Project> {

    @FilterHibernateMapping(value={"customer.name", "customer.fullname"}, type=FilterHibernateMappingType.OR)
    @FilterPropertyAvailableToUser
    StringLimiter customerName();

    @FilterHibernateMapping("startDate")
    @FilterPropertyAvailableToUser
    DateLimiter startDate();

    @FilterHibernateMapping("projectManager")
    @FilterPropertyAvailableToUser
    VersionedEntityLimiter<User> projectManager();

}
```

demo

Filtering - result



Filtering - result



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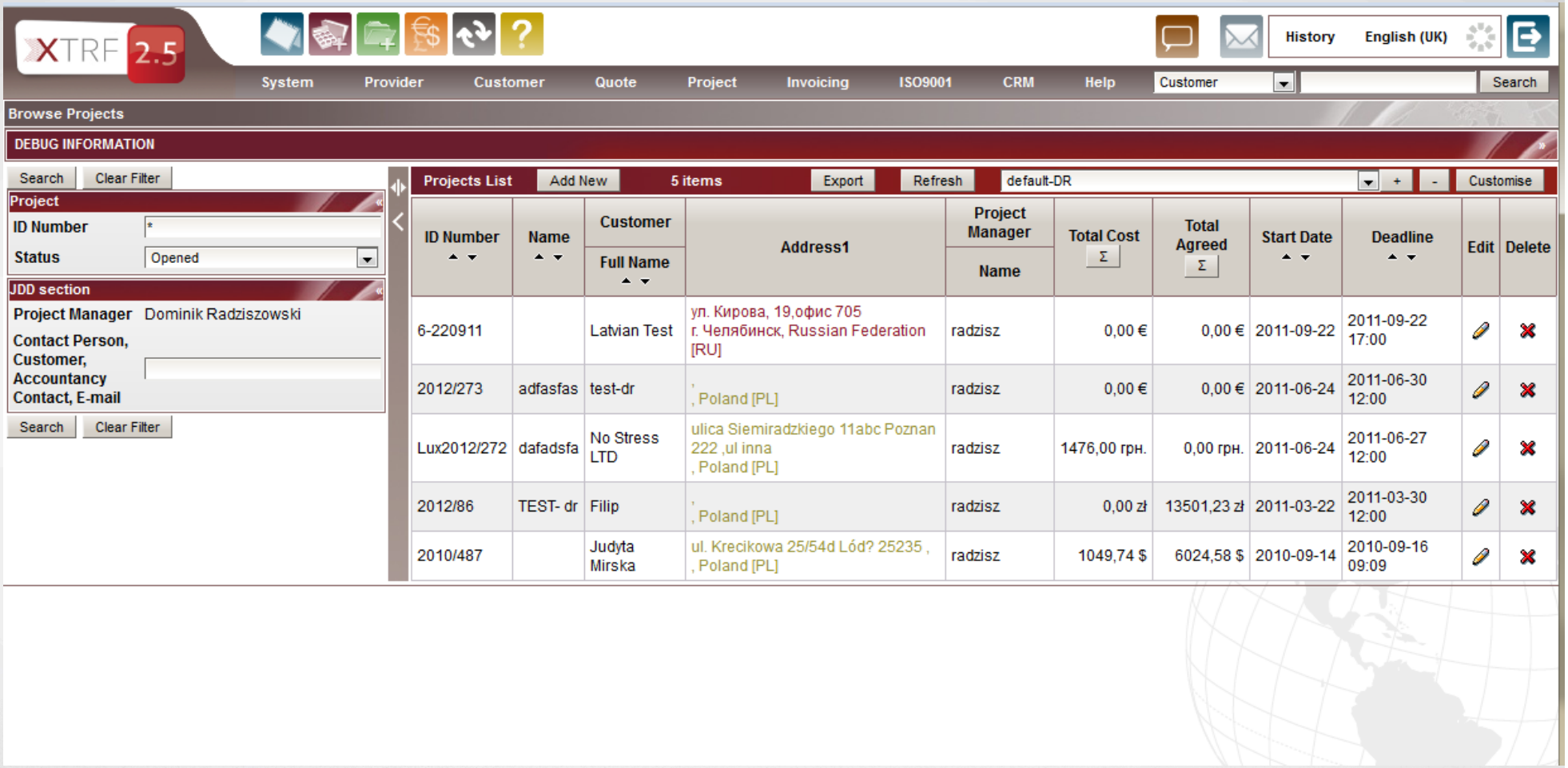
Filtering - result



ID Number	Name	Customer Full Name	Address1	Project Manager Name	Total Cost	Total Agreed	Start Date	Deadline	Edit	Delete
6-220911		Latvian Test	ул. Кирова, 19,офис 705 г. Челябинск, Russian Federation [RU]	radzisz	0,00 €	0,00 €	2011-09-22	2011-09-22 17:00		
2012/273	adfasfas	test-dr	, Poland [PL]	radzisz	0,00 €	0,00 €	2011-06-24	2011-06-30 12:00		
Lux2012/272	dafadsfa	No Stress LTD	ulica Siemiradzkiego 11abc Poznan 222 ,ul inna , Poland [PL]	radzisz	1476,00 грн.	0,00 грн.	2011-06-24	2011-06-27 12:00		
2012/86	TEST- dr	Filip	, Poland [PL]	radzisz	0,00 zł	13501,23 zł	2011-03-22	2011-03-30 12:00		
2010/487		Judyta Mirska	ul. Krecikowa 25/54d Lód? 25235 , , Poland [PL]	radzisz	1049,74 $	6024,58 $	2010-09-14	2010-09-16 09:09		

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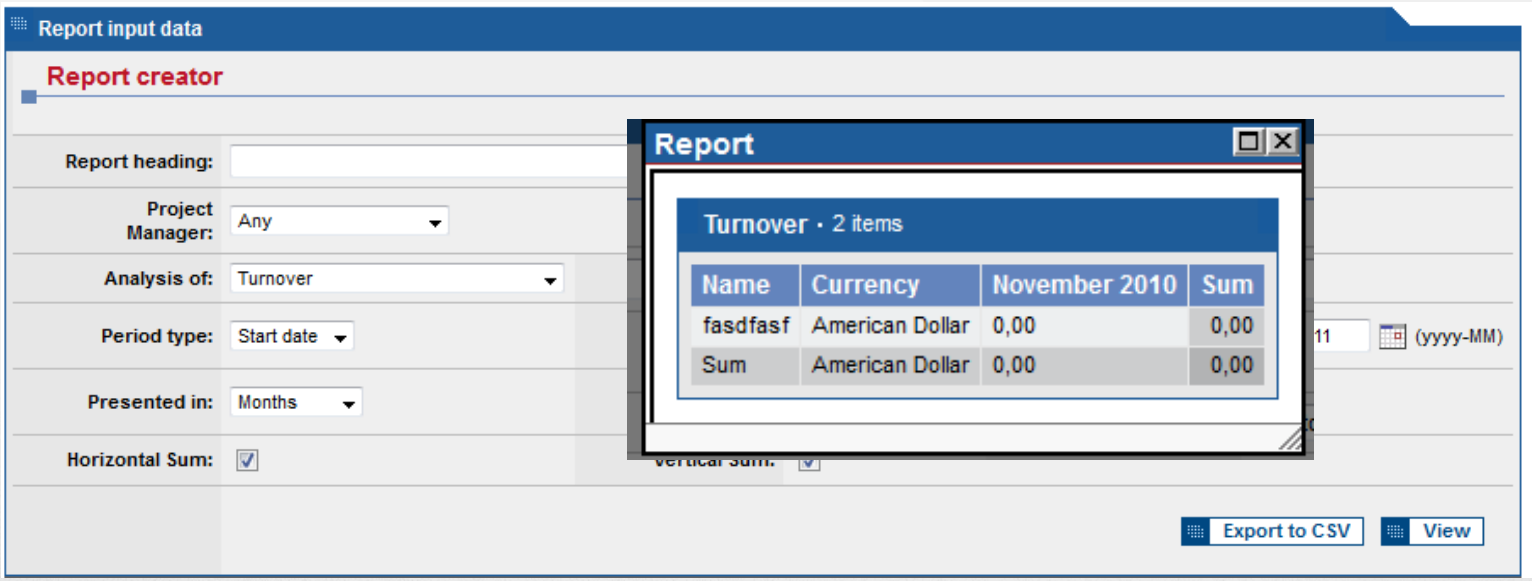
Filtering - summary

- Initialized on system start-up
  - filter consistency validation
  - filter implementation generation
- Ultra effective and consistent code
  - creation of a new filterable property:
    - domain class and filter interface modifications
    - proper annotations
    - migration script for db (out of scope)
  - no more broken queries
    - e.g. addressing badly refactored attributes
- Extreme flexibility
  - sub-filters
  - persistent
  - sharable
  - filter subscriptions (email notifications)

Reporting – the problem (2009)

- Hardcoded
- Poorly parameterized
- Limited
- Write your own reports if you know HQL…
  - but DB schema/OO model evolution



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Reporting – the challenge

- Allow user to define own reports using GUI
- Base reports definition on the entire domain model
- Table like reports and charts

- Aggregation functions (number of, value, relation)
  - Defines report content (e.g. project ROI, number of projects, projects total etc.)
  - Defines the base entity for the report (Project, Invoice etc.)
- Columns and rows grouping
  - per customer, per PM, in given time: weekly, monthly
- Filtering
  - Include only VIP customer, only finished projects, etc.
- Individual access rights

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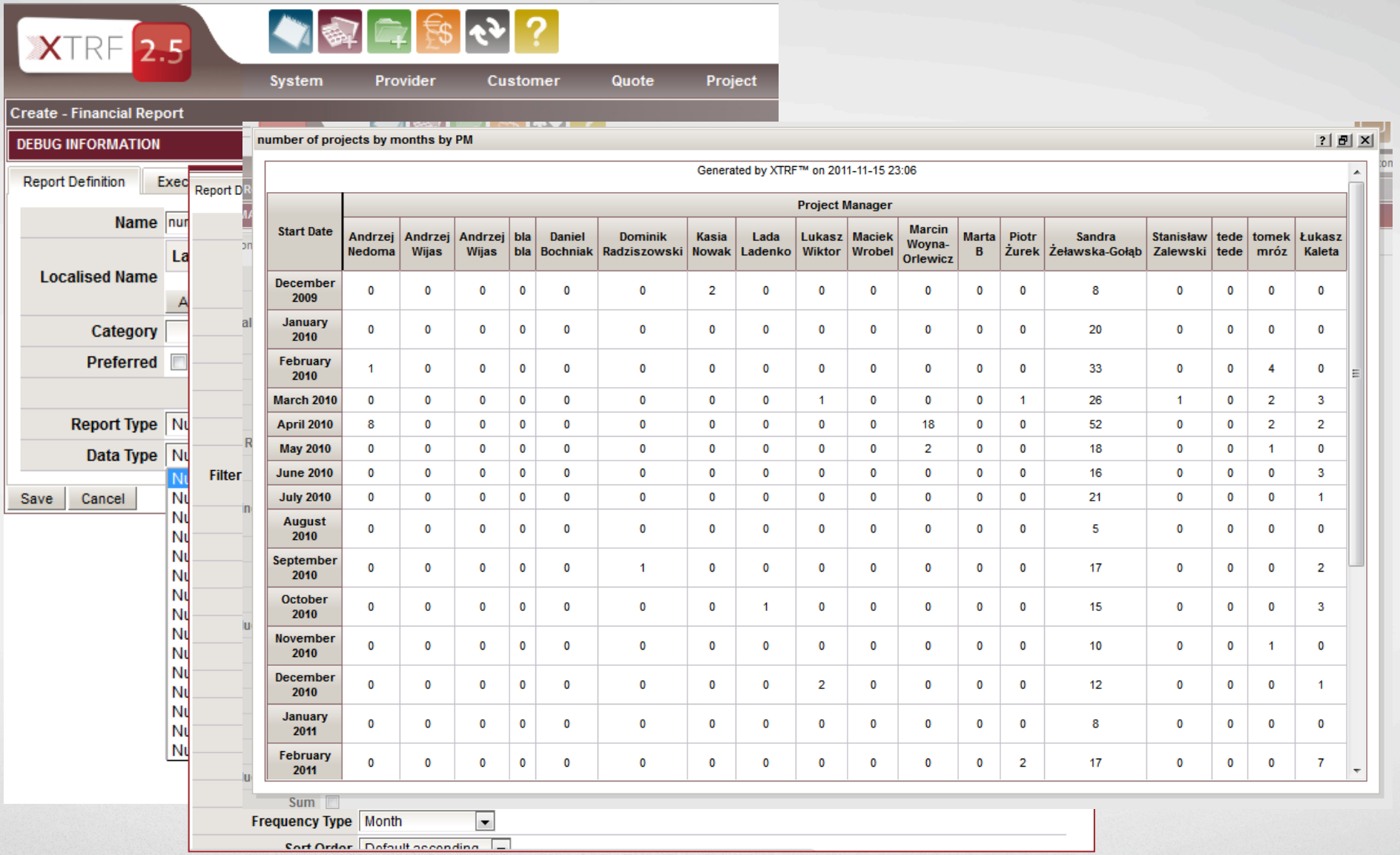
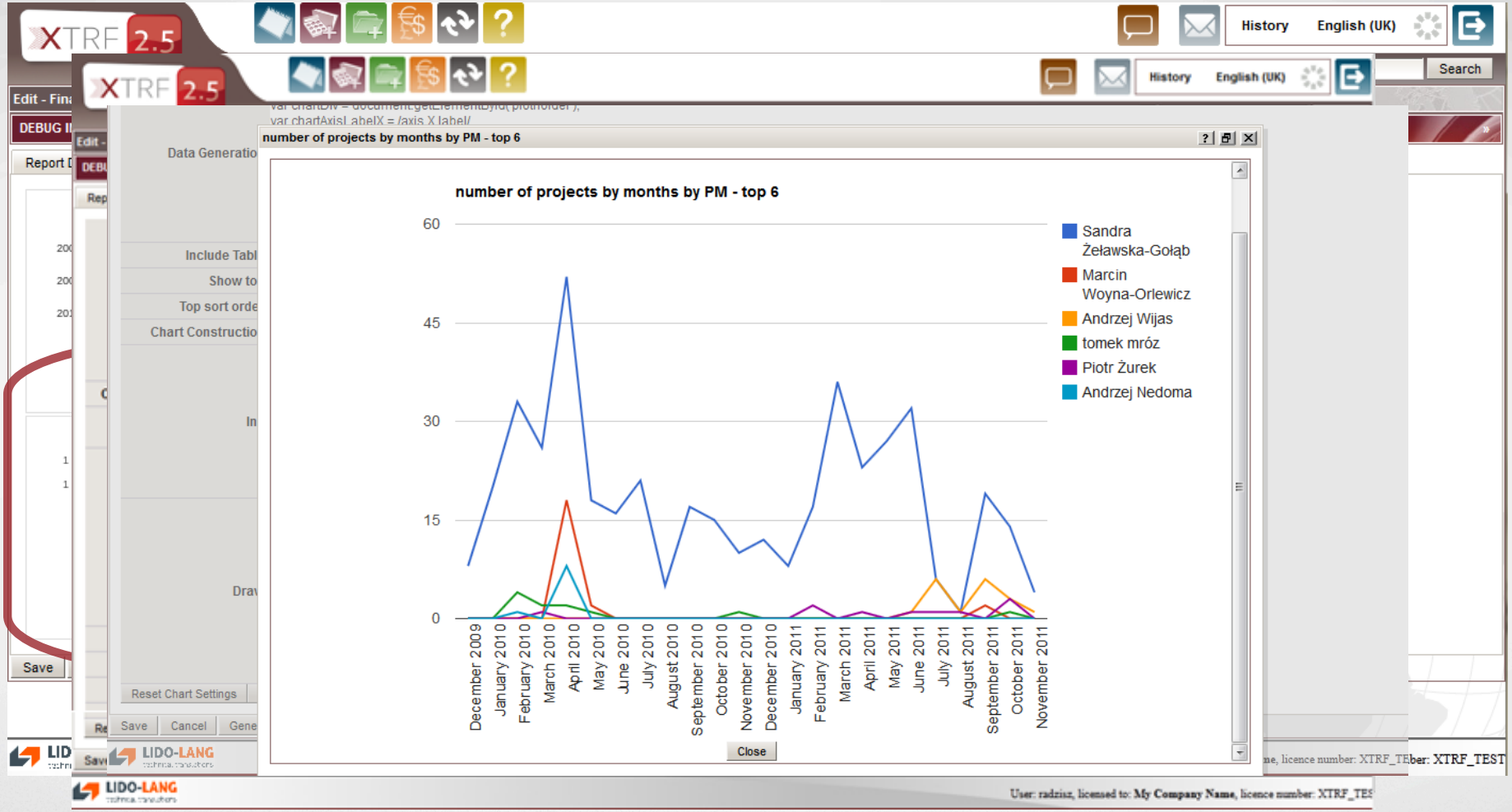
Reporting (2010)



Start Date	Project Manager																	
	Andrzej Nedoma	Andrzej Wijas	Andrzej Wijas	bla bla	Daniel Bochniak	Dominik Radziszowski	Kasia Nowak	Lada Ladenko	Lukasz Wiktor	Maciek Wrobel	Marcin Woyna-Orlewicz	Marta B	Piotr Żurek	Sandra Żeławska-Gołąb	Stanisław Zalewski	tede tede	tomek mróz	Łukasz Kaleta
December 2009	0	0	0	0	0	0	2	0	0	0	0	0	0	8	0	0	0	0
January 2010	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0
February 2010	1	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0	4	0
March 2010	0	0	0	0	0	0	0	0	1	0	0	0	1	26	1	0	2	3
April 2010	8	0	0	0	0	0	0	0	0	0	18	0	0	52	0	0	2	2
May 2010	0	0	0	0	0	0	0	0	0	0	2	0	0	18	0	0	1	0
June 2010	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	3
July 2010	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	0	1
August 2010	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0
September 2010	0	0	0	0	0	1	0	0	0	0	0	0	0	17	0	0	0	2
October 2010	0	0	0	0	0	0	0	1	0	0	0	0	0	15	0	0	0	3
November 2010	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	1	0
December 2010	0	0	0	0	0	0	0	0	2	0	0	0	0	12	0	0	0	1
January 2011	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0
February 2011	0	0	0	0	0	0	0	0	0	0	0	0	2	17	0	0	0	7

Reporting – charts (2011)



XTRF - result

- 130+ installations all over the World
- 15+ full localizations
- 25+ languages supported
- Ranked in the top 3 system in this market
- Own capital

We are offering localization expert services and are open for partnerships ☺

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The Core Team

XTRF

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From a long-term perspective, flexibility is worth the effort.

Dominik Radziszowski
radzisz@xtrf.eu

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