



EMPOWERING

Customers to save energy by informative billing

Deliverable D5.3

Practical experiences of widespread application of additional services of EMPOWERING



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Executive summary

This summary is focused on the widespread application of the project EMPOWERING and the related services. The experiences of the four utilities participating in the project are presented and summarized as a guideline for other utilities willing to implement these or similar services. The collected experiences can help the utilities to avoid problems by detecting them in advance and by providing recommendations on how to perform better.

It should be highlighted that each utility in EMPOWERING is working in different country and, respectively, in different market environment. Each market situation has to be analysed in order to find the optimal service set for the market and the best way to implement and offer them to the customers. The legal restrictions for each market have to be analysed thoroughly before such a project is set up and important decisions related with the offering of the services are taken.

Do a Research concerning:

- Legal restrictions for:
 - Opt-in or opt-out situation: Can you offer the services without permission of customer (opt-out) OR you need the action of the customers to get into the system (opt-in)?
 - Privacy & data protection: Are you allowed to transfer data of customer (e.g. energy consumption) to an external data centre (empowering, big data centre etc.)?
 - Billing services: Are you allowed to change the layout of energy invoices and include there the new services?
 - Level of liberalization/unbundling: Which department in your utility can be responsible for the project?

- Customer behaviour:
 - What is the attitude to energy saving of the customers? Are they open or annoyed to this theme?
 - Are they open for online systems or do they have fear from violation of privacy?

- Technical situation:
 - Does the project fit to your IT strategy?
 - Do you have enough (skilled in big data technology) IT resources?

After all these questions and even many more have been answered you can set the aim of the project and start with implementation!

The aim of the project will be different for every utility. It can range from fulfilling of legal requirements, selling energy efficiency products, to marketing image campaigns. Be honest as you find this aim, it will save a lot of resources and money.

Most of the unforeseen challenges can be avoided with a good preparation and project planning.

The specific lessons learnt in empowering project:

Billing services	Billing services by energy report attached to the bill is the most effective way to reach customer (as long as it is possible by legal restrictions and you are in an opt-out situation)
Online services	Online services are mainly used by energy-experts and won't be a tool for mass customers.
Energy retailers	Retailers are in contact with the customers and are more interested in the services than the DSO.
Technical specialist	Big data needs specialists who are not always available.
Support of general management	Permanent support of general management is needed as a lot of other departments will be involved.
Simple services	Offer simple services which can easily understand by customer
No big marketing campaign	Big campaign might cause a financial lack but causes no more users.
Marketing fits to technical implementation	Do not set marketing actions before system is working perfectly.
Monitoring for services	Use a monitoring which is evaluating user, services (clicks) and clicks by user.

As the level of liberalization of energy market is increasing and every utility is looking forward for services which are not offered by the competitor, EMPOWERING gives you the possibility of market diversification. Especially due to the roll out of smart meter and the need of new and special services in this new market environment makes it necessary to set actions and develop new services for the customer. The possibility of using big data technology is quite flexible and every utility is able to define the services by itself and develop the most interesting services for customers. As more and more the level of liberalization is increasing the more will be new legal restrictions and regulations concerning smart meter technology and what kind of services you have to offer to your customers. So EMPOWERING is and will be a combination of marketing and customer service, as well as fulfilling more and more legal specifications.

1 Introduction

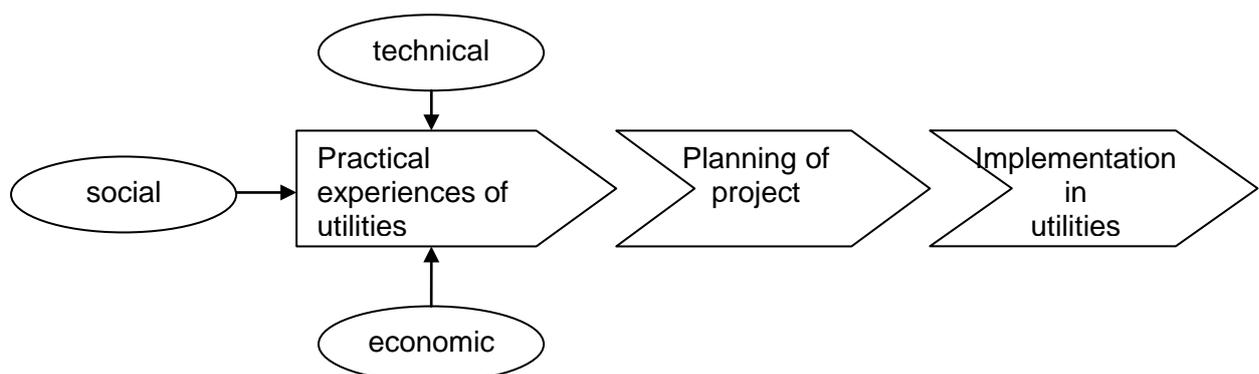
This document will summarise the practical experiences (technical, social and economic challenges) of the four utility companies and their customers, with the implementation of EMPOWERING services. All information in this document has been collected and summarized during the project. The sources were several surveys and questionnaires, from employees, customers and stakeholders. Additionally, information has been collected in a series of conference calls among the utilities and in-depth interviews about their experiences which took place by the end of the action. At the beginning they have been asked to develop the services and get information of the expectations of the customers, as well as the results during and after the implementation of the services.

The document targets the experience sharing with other utility companies interested in adopting the similar services. The strong and weak points will be highlighted and the necessary changes that have to be adopted by the utility companies will be explained in detail. Also shown are the operational implementations which have to be done to maintain the operational quality.

The document will comment some common problems as well as specific differences that have conditioned the implementation in each utility. Especially the differences are important to replicate the project EMPOWERING or similar services. Detailed analysis has to be done to figure out the starting situation of the utility, to avoid problems in the implementation and to aim the defined objective.

First of all the basic issues and considerations will be shown. Especially the reasons for the participation in the project and the organisational structure of a utility will be illustrated. As utilities of different countries took part, a lot of special cases and challenges occurred. The paper will show all these cases and describes how utilities deal with them.

The figure below shows the influence of the social, technical and economic specifics in every utility which have been considered to get practical experiences to implement the services in the utilities.

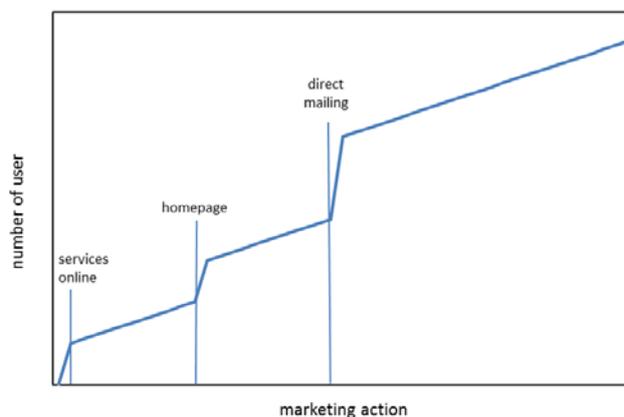


The paper will describe all general and individual challenges which the utilities were confronted with and shows possible solutions to help other utilities. The challenges mainly belong to the different situation in each country (e.g. legal situation) and will be described in this way in the document. Other common challenges, like technical and organizational, will be handled under this topic.

The engagement of the users is one of the principle tasks for assuring the service success. The practical experiences of four different utilities in different European countries will provide useful base for other utilities replicating the services to set up their successful strategies.

It will be shown activities which were more and less useful concerning the engagement of the customers. Some activities are quite simple and inexpensive, but on the other hand there could be expensive activities which do not increase the engagement of the customers. The document gives examples and a guideline to find a good way to avoid marketing mistakes and optimize the activities which can or should be set by the utility.

Example for possible change of user concerning marketing actions



The figure above shows the response of the customers to marketing campaigns, which are possible way of increasing the number of users. Therefore an implementation of a monitoring system is useful to see, which action increases more or less the number of users. Especially concerning marketing actions and new functions of the system it is a very helpful instrument.

All lessons which have been learnt will be pointed out to get a better result for every utility which wants to implement such a system concerning technical, social and economic matters.

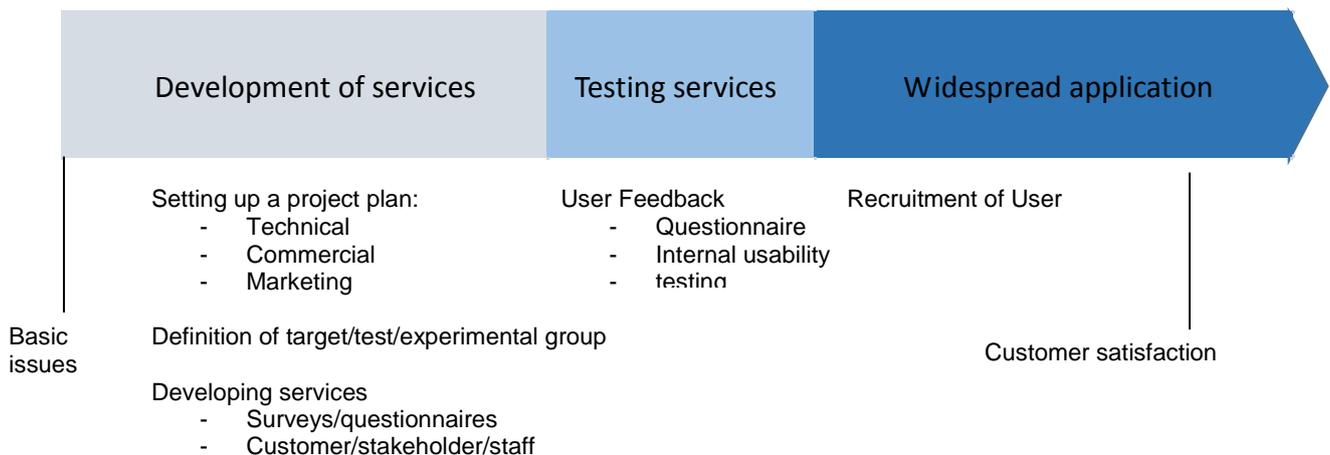
2 Service operation

The graph you can see below shows the timeline of the project EMPOWERING. It starts from the development of services, to the time of testing and proceeds to the widespread application.

As it is a cross company project where many departments are involved, a lot of resources are needed. So the most important questions concerning this kind of projects in a utility have to be answered before the project starts. As a result, the great evidence is achieved on the market.

It helps to convince the general management of the utility to find a general agreement for the project.

The figure below shows the timeline of the project, like it happened in EMPOWERING. The more the experiences of the project will be considered, the more the processes will work more effectively.



2.1 Basic issues and considerations

The basic issues have to be cleared before starting the project, as setting up a project plan for the target group to reach the individually defined aim of the project. In this approach, the project plan can and will be different in every utility. The next points will be the summarized basic issues of the four utilities of empowering with no guarantee of completeness for other utilities.

Finally, a definition of success of the project has to be set up. For example if the reason of the project is to raise customer loyalty then the number of users or the use of services could be a

figure of interest. If there is a legal reason the success can be the setting up of service and fulfilment the legal affords.

2.1.1 Reasons for offering the services

- Improve the image of smart-meters
The public image of smart meters decreased concerning the discussions due to the costs, privacy and data security. So the utility needs to point out the advantages of this technology.
- Gaining a USP (Unique Selling Proposition) on the market by using smart-meter services (tariffs, analysis)
- Additional services for customers (mainly in combination with other online services)
 - reduce high consumption questions (by self-services)
 - reduce customer care costs by increasing self-service
 - reduce complaints and increase customer satisfaction
- Enable product sales (energy consulting for households, energy efficiency products)
- Fulfil legal obligations e.g:
 - energy efficiency law (helping customers to save energy)
 - Separation of DSO and retailer issues is causing various challenges for utilities. In this case the utility (DSO and Retail) has to offer meter data in special quality in a specific timeline to the customer. This is different for DSO and Retail. DSO is focused on data quality and Retail is more focused on evaluations. As the data base is the same (15min), big data technology with EMPOWERING services help to fulfil these requirements.
- Prepare and involve it in a larger scale program

2.1.2 Organisation of the utility staff

As it is a crossover project a lot of persons will be involved. In EMPOWERING the following departments were most effected:

- Responsible department as the project leader (e.g. DSO or retail – see 2.2)
- Commercial Department/Marketing/Product Management
- Technical Department/IT-Services
- Customer Service/Call-Center/Back-Office

2.1.3 Customer Recruitment

The main task of the widespread application was to get clients/users into the system. Depending on the legal situation of every utility (e.g. opt-in vs. opt-out) the recruitment is mainly a task of marketing actions:

- By newspaper (customer magazine, local newspaper, online-newsletter)
- Information with energy bill
- Internet (homepage)
- Several events and meetings (internal and external)
- Direct mailings (by e-mail and letters)
- Shared use of other channels/campaigns, which belong at least partly to the topic
- Various Surveys and questionnaires
- Shared use of other channels/campaigns, which belong at least particular to the topic

2.2 Special cases in the utilities

- Service offering approach

The situation of opt-in appears in Austria and France. Customers have to agree to get into the system. A couple of laws are affected like consumer protection, law of transmission of data, unbundling, privacy and data protection.

On the other hand, the opt-out option in Italy and Spain relieved the widespread application as all customers are automatically in the system.

- DSO or retail

Depending on the level of liberalization of energy market, utilities tend to transfer responsibility of the project to DSO and/or to retail. The lower level of liberalization the more DSO has been put in charge as DSO has the data sovereignty of meter services (especially smart meter data). On the other hand in a society with a quite high level of liberalization, the retail department of the utility was responsible for the project as the retail is in charge for all customer issues and has data sovereignty of the personal customer data. As this project needs a quite personal and direct contact to the customer, which is causing challenges for DSO, the experience was to prefer the retail to implement the services for the utility.

- External departments or do it by your own

Spain, France and Italy had external support for the project. In Austria everything was done in-house. The decision for external support or not incumbents, every utility makes by itself. The table below should give a helping hand.

Advantages and disadvantages of an internal vs. external structure:

Internal structure	External structure
knowledge of utility	Less knowledge of utility
Secrets of utility secured	Usually more active
Other priorities/projects	External costs
Risk of wasting resources (time)	Less risk of wasting resources (limited hours/€)

- Combination with other internal programs

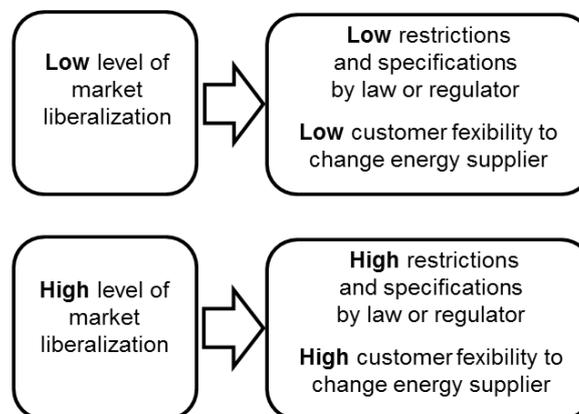
Other programs within the utility help to implement services like EMPOWERING. Investigate the utility for adjacent projects, services or marketing activities. In every utility there are a lot of similar projects or marketing channels which can be used. For example in

Austria the EIS (Energy Information System, where customers can check their invoices and consumption online), in France E-Fluid (the invoicing service) or „Mur-Mur“ (a multi-dwelling building renovation program).

- Different level of liberalization of the energy market

As four utilities from four different countries took part in Empowering, it was obvious that in every country there are different levels of liberalization of the energy market. So there are also different levels of customer flexibility and even the possibility for the customers to select alternative energy suppliers. The more liberalisation of the energy market has advanced, the more restrictions and specifications are issued by the legislator (e.g. opt-in/opt-out, data protection, privacy, data transfers, layout of invoices)

We found out that liberalization is most advanced in Austria. On the opposite side Spain has the lowest level of liberalization. For example in Spain it is possible to create the energy invoice by utility (as ELGAS did by implementing the EMPOWERING services in the invoice). In Austria the layout of an energy invoice is mainly defined by the legislator, so it is (nearly) impossible for the supplier to influence the layout of an energy invoice. So the higher the level of liberalization of energy market, the more challenges are coming up concerning restrictions/specifications by law/regulator and customer flexibility for changing energy supplier.



2.3 The evolution of the user registration

A reporting has been implemented to monitor the marketing and technical actions in correlation to the number of users.

In the phase of developing the services, user were needed for helping in workshops or by interviews to develop the services. In order to acquire these users the utilities started various marketing actions to motivate them to register for the system. These users were quite helpful to configure the services and to consider customer behaviour.

In the table below shows the number of users (maximum possible and registered user) of every utility from January 2015 to September 2015. Please consider that utilities in Austria and France are faced with an opt-in situation and are offering the online services only. On the other hand Spain and Italy do have an opt-out situation in which Italy is offering billing tool only. Under these circumstances it is a challenge to compare the number of users of each utility.

Conclusions

Utilities, which are offering the services in opt-out mode, do not have the challenge to bring customers into the system as every customer is already in the system. In this case utilities do have already all personal data from customers, which makes it quite easy to get in contact with these users and evaluate services and get feedback.

The combination of opt-out situation and offering billing tool is generating a high user amount and response of customers as every customer is paying attention to the invoice. As long as possible for utilities it will be an effective way to reach customers by the EMPOWERING services without high costs for marketing actions.

Utilities, which are in an opt-in situation do have the challenge to bring customers into the system as it is shown for Austria and France. Customers are quite sensible as they have to agree for “something” to get “something” they cannot understand completely. Especially as they have to agree for personal data processing for any case. Even huge marketing campaigns which were causing high costs, did not bring significant more users to the system. On the other hand those users who signed for the system were really interested in the services and were using much more the online tools than other users. As it can be seen in the graph below, the activity of the users were quite high compare to the total amount of users.

number of user				
online tool			billing tool	
(possible/registered)				
Austria	France	Spain	Spain	Italy
1980/61	5000/85			
2016/66	5000/85			
2051/73	7000/87			
2070/77	7000/87	364/309	7362	1725
2094/79	7000/87	364/319	7391	1725
2156/83	7000/87	364/334		1725
2173/88		364/343	7377	2813
2195/97		364/350		2813
2213/99		364/366	7385	2813
Opt-in		Opt-out		

Timeline: 01/15 to 09/15

Marketing actions

Improvement of services

For the evaluation of every single service and so for the improvement of services it is useful to implement a monitoring for every single service as it is shown as an example below. This monitoring is very specific for every utility as it is mainly focused on layout and usability of services within the website of the utility.

Below can be seen an example for a monitoring system. Every single service will be monitored by every click on it. Even every login, so it could be possible to see who is doing what and which service is more or less of interest for the customer.

ZUGRMON	LOGIN	ANZ_REC HJAHR	ANZ_KA LJAHR	ANZ_MO NAT	ANZ_TA G	ANZ_VIE RTEL	ANZ_DA TEXPORT	ANZ_EN ERKOST	ANZ_TA RIFSIMU L	ANZ_EM P_OT101	ANZ_EM P_OT102	ANZ_EM P_OT103	ANZ_EM P_OT201	ANZ_EM P_OT204	ANZ_EM P_OT302	ANZ_EM P_OT305	ANZ_EM P_OT501	ANZ_EM P_OT504	ANZ_EM P_OT703
2014-05	1060	131	79	451	1154	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014-06	1068	159	89	499	1228	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014-07	1250	185	109	722	1512	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014-08	1283	1514	37	235	668	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014-09	1483	1531	40	302	688	96	0	0	0	0	0	0	0	0	0	0	0	0	0
2014-10	1614	179	109	797	1622	209	0	0	0	0	0	0	0	0	0	0	0	0	0
2014-11	1240	202	105	544	1593	78	0	0	0	0	0	0	0	0	0	0	0	0	0
2014-12	2301	483	178	932	2279	120	0	0	0	0	0	0	0	0	0	0	0	0	0
2015-01	2273	494	342	2052	2263	413	0	0	0	24	0	26	54	0	0	0	0	0	0
2015-02	2101	316	166	1335	1708	783	0	0	0	57	0	53	70	0	0	0	0	0	0
2015-03	2129	276	121	1224	2053	662	23	25	13	34	0	38	54	0	0	0	0	0	0
2015-04	1928	201	82	913	2074	649	65	91	24	24	0	13	66	0	0	0	0	0	0
2015-05	1777	222	96	857	1954	379	46	75	23	23	0	16	67	0	0	0	0	0	0
2015-06	1880	224	84	831	1836	285	80	72	24	16	0	22	61	0	0	0	0	0	0
2015-07	1583	168	65	754	1535	558	41	60	37	12	16	14	23	4	1	1	12	4	2
2015-08	1635	194	160	896	1586	866	0	24	62	17	14	6	15	23	1	1	31	9	14
2015-09	1706	250	146	987	1597	873	0	36	59	25	1	12	10	19	8	0	23	3	2
2015-10	1136	126	99	640	1182	477	0	19	25	15	4	14	14	21	11	4	22	5	5

Timeline

User Login

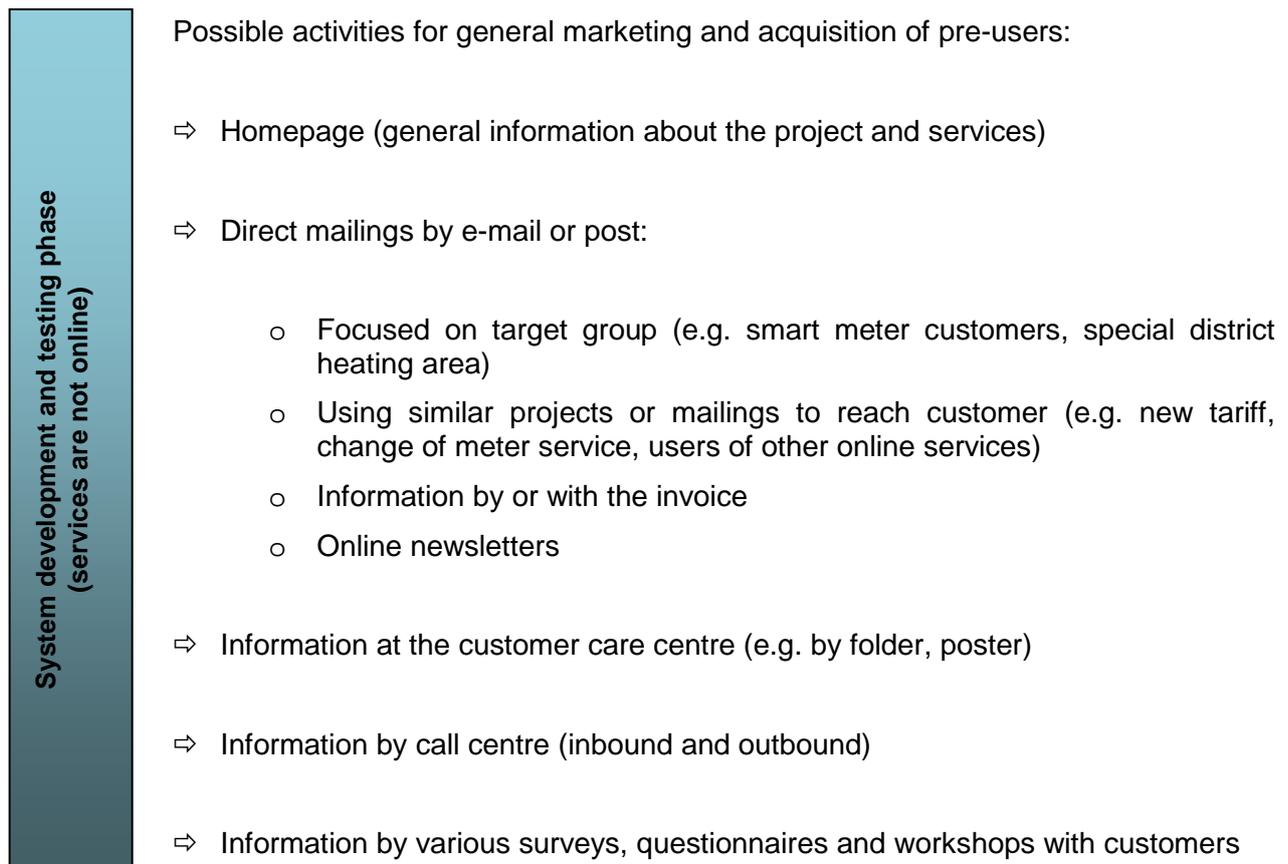
services

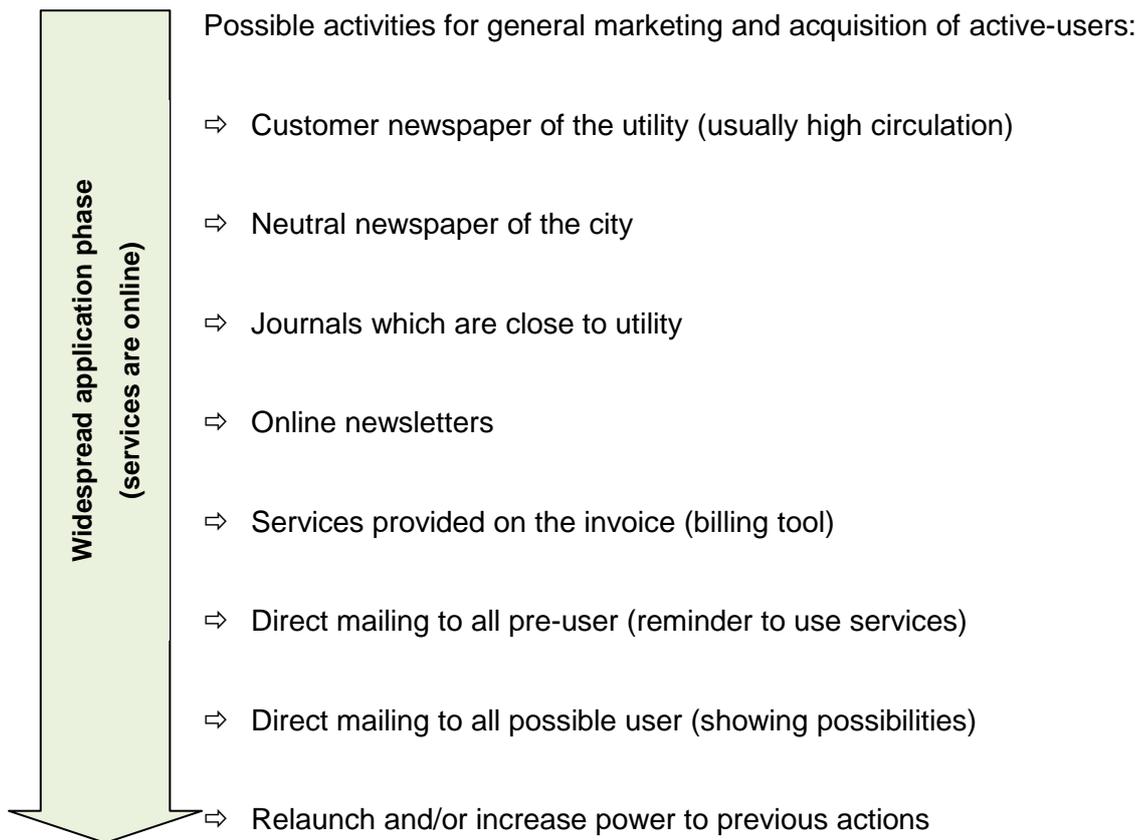
2.4 Widespread application

After implementation and testing of the system/services, the next step will be the widespread application to get user into the system. Keep in your mind the aim of the project and the intention why you are offering these services.

The following list gives an overview of all actions which have been set to inform customers about the services in all utilities. Depending on the situation of the utility, more or less intensive actions have been set to motivate the customers. As already mentioned in phase of development and testing, customers have been contacted to take part in the project by interview, surveys, questionnaires and finally as (testing) users of the system helping to get a good acceptance.

Graph – possible marketing action plan





Most of the pre-users who registered to the system have been recruited during several surveys, questionnaires and workshops. Other activities like mailings were not so effective. It would have been easier to bring customers to and keep them in the system if they would have had the possibility to use at least a few services or pre-versions of services so that they can imagine more about the project. If services are not online for a quite long time after registration, customers are losing interest in them. Customers expected to use and see online services in the system as soon as they enter the homepage (with or without registration).

The registration is a psychological border for customers for entering the system. As customers have to pass various security checks (depending on styling of registration) it was quite difficult to keep customers in mode for services. More or less difficult registration is based on different legal requirements for online services in each country (e.g. data security, privacy). All in all and regardless of the marketing campaigns, the access to the system and the services should be as easy as possible!

As widespread application phase started a lot of marketing activities have been set, especially in utilities which were offering online tools only to increase number of users. Registered users here were quite low and even a lot of different marketing actions did not cause a high number of new users.

It has been seen that online tool is mainly used by “energy-experts”, so big marketing campaigns were not very useful as they would use the services anyway. This kind of users will be better targeted by online marketing actions like mailings or newsletter.

Utilities which offered billing tool (and were even in an opt-out situation) were not in the need of various marketing actions as services sent to customers without any special permission set by customers.

If possible for utility, it makes sense to use billing tool sent together with the energy bill for widespread application as target group (“normal” customer) will be reached pretty exactly. On the other hand the online tool is focused on “energy-experts” and should be handled like this in marketing actions.

3 Experiences of the utilities from the service operation

3.1 Development of services

The next points will show briefly the service development steps, from project plan to the definition of services.

3.1.1 Setting up project plan

Setting up the project plan

After the basic issues had been asked, the following answers were received:

- reasons for project (e.g. legal, customer loyalty, selling products, customer services)
- target group
- definition of staff
(e.g. internal or external, DSO or retail, directly and indirectly affected departments)
- customer recruitment and marketing actions
- challenges

With these facts it is possible to set up a (typical) project plan and a timeline.

3.1.2 Definition of services

In EMPOWERING were in mind a large number of services and a flexible approach was adopted. The utilities pre-selected the services which were interested in, and this selection was then fine-tuned by asking the customers about their preferences, in order to offer services which are well accepted. The preferences of the customers about the services have been detected by several interviews, surveys and workshops.

Take care that the services fit to your target group!

Example of Italy for surveys (like in all utilities):

Target group	Date of survey start	Date of survey end	Number of responses	Purpose of survey / WP / questionnaire file name
External stakeholders (focus group RE)	12.06.2013	12.06.2013	9	Design the questionnaire for Italy, collecting first context information on the feelings of end users on energy services/ WP2/FocusGroupPlan.docx
End users	June 2013	Sep.13	514 (of which 51 met by one-to-one interviews in Reggio Emilia)	User expectations to design the EMPOWERING services/ WP2 /Questionario Italia.docx
External stakeholders	February 2014	March 2014	5 organisations, (7 respondents)	Collect feedback on the EMPOWERING services after their implementation and before their launch/ WP2/EMPOWERING_questionario stakeholders.docx
Utility staff	February 2014	March 2014	11	Understand the capability of utilities' staff not involved during the implementation phase of the EMPOWERING project to support the end users in wide application phase/WP4/EMPOWERING_questionnaire for technicians.docx
External experts on usability (focus group)	March 2014	March 2014	6	feedbacks by external experts on energy, infographics, psychology, web development, graphics, cultural mediation on the mock ups developed in all pilot countries and suggestion on how to improve their usability/WP4/Focus Group Interview.docx
End users	Sep.14	October 2014	15	Usability of EMPOWERING services/ WP4 /WP 4 questionnaire.docx
End users	June 2014	October 2014	25	Baseline on customer satisfaction about EMPOWERING / WP6 QuestionarioGradimentoEMPOWERING.docx

The result of all these surveys, questionnaires and workshops were the definition of every individual service for every utility.

3.2 Technical experiences and challenges

- Integration of EMPOWERING with the IT system
 - The DSO owns a solid IT infrastructure able to provide verified data for billing, which is mainly regulated by law. As retail is responsible for the project, there will be at least the same infrastructure needed like DSO and probably more information will be needed than DSO is able or is allowed to offer (e.g. granulation of data). So probably a few services cannot be offered like demanded by the retail. Mostly the data exchange process between the DSO and the retail is standardized and very well structured - but it's different in each country. So you can't use this formats for data exchange to a third party organization which has to operate in an international context across different countries over the EU. So the goal for participating utilities has to be set in improving an internal data exchange process to several target formats for contract and consumption data, if there is the requirement to interact above national borders. For launching future projects and also for the IT suppliers it would be very helpful to regulate this data exchange formats by the EU.
 - The data sending process could be quite complex so it could be a challenge to hold the integrity. If so, a quality check of the data sent is helpful to get more information about missing data at the Insight Engine. Before any exchange of data a secure infrastructure has to be provided by both sides. Take care that the installation and implementation of certificates works different at any used infrastructure (JAVA, .net, ...). You would be well advised to organize external support or to plan enough time for setting up the security, if you do that the first time. At the implementation of the data sending process itself you should not forget to set up an efficient logging mechanism. This helps to set up a restart in an easier way if the data sending was interrupted and so you don't have to send all the data again. Over all this could save much time especially at the initial load of the Insight Engine when the data of all contracts and over a longer historical period has to be sent.
 - The next process to be looked at concerns the data improvement mechanism and holding the data consistency between the internal 'sending engine', the Insight Engine and the result at the provided end user service. The implementation of an extraordinary IT-service gave the possibility to check completeness of the data between Insight Engine and internal sending engine. This helped to improve the level of support and accelerated the solution finding process considerable. For the user support and the error finding process it is strictly recommended to have the possibility to determine the state of the (consumption) data at any level and place of aggregation – inside and outside of your own implementation (raw metering data, sent data, Insight Engine data, data at end-user service – result provided to customer). To avoid that the problems of data integrity attain the end-user of the EMPOWERING services you are well advised to set up an automatic monitoring and consistency checking tool. Therefore you can interact in case of any problems in

a very early phase and you have much more chance that an out coming problem doesn't reach the customer. As we made the experience the customer (user) gives you exactly one chance as the last chance to repair a malfunction of a service – indifferent if data is incorrect or the service itself doesn't work correctly.

- A challenge could appear with an embedded invoicing service and the associated online agency, as the product package has predefined time frames and review schemes. Any modification requested to integrate new e-services, which would not be within the overall product regular roadmap could be very costly and could give restrictions on e-services development in the context of EMPOWERING.
- The major migration to the online agency and the invoicing application package could lead to complex bulk historical data extraction as requests have to be done manually.
- The challenge of the “Big Data”, in this context, is not the calculation of a large amount of data, but to assure a fast and reliable data flow between the involved systems. It could be complex to collect permanently all the measures from the meters and to push or download these data from the remote calculation engine. This is more a challenge of the internal IT of the utility, based on various internal interfaces, than the interface to the insight Engine.
- A change in the meter architecture could be necessary. It should be regulated how to handle meter data in next generation systems.
- Lack of sufficient technical staff (staff only dedicated to critical business procedures and lacking time for other implementations). IT staff could be withdrawn to other (more or less important) projects. This will cause a delay in all other processes. As a lesson learned for a project like EMPOWERING, which has a large impact to customer relations it is very important to give an appropriate priority to the project. This should lead to continuous availability of the IT staff during the whole project. Therefor also a short reaction to occurring problems during the implementation and spread-out phase is necessary.
- The timeline of the project couldn't meet internal timeline for other IT projects of related systems. So a coordinated IT plan could help to avoid interest conflicts. The agreement of the general management could be helpful to give this project priority compare to other projects.
- Coordination challenge of IT staff could appear if the staff is spread over multiple departments and companies. This could lead to longer problem solving circles. A solution could be permanently Jour Fixe to establish a better communication process.

- EMPOWERING implementation requiring specific technical skills
 - The general problem is the availability of time and skilled staff.
 - The data extraction and preparation for sending in the utility might be complex, and can take more or less time depending on the specificities of the system, and the internal limitations imposed.

3.3 Organisational challenges

- General management support
 - At the beginning of the project, the commitment and support of the general management is needed and one of the most important parts. In Empowering, every utility got this support. A change of general management, like in France (GEG), caused several problems in the implementation of the project.
- Low identification of staff with the project.
 - Due to the project plan, we had to involve the whole staff and a lot of other persons (internal and external) a long time before the project was implemented in our company. During the implementation (app. 2 years) we had to involve and/or inform them as well. The problem is, that these persons got annoyed and bored after a while as they were not able to see any results.

The solution will be (again) the permanent support of the general management and even all other involved supervisors. The start should be in a small project group of experts to implement the services. Involving others can be done just in the necessary time. So as soon as the system works and not months before. You will get the support of all involved persons as long as the (subjectively) output of the project (e.g. income, avoid problems with legislator/regulator, marketing output...) is higher than the expenditure.

- Reluctance of utility staff to implement changes in metering and billing processes
 - Changes in metering and billing are very sensible areas in our company. So the staff is very cautious if somebody wants to implement something, especially if it is not in the core of our main business.

So the system (or services) which belong to these changes has to work perfectly before the staff is in the mode to work on it. Especially concerning to marketing activities – do not set marketing actions before the system works perfectly. Testing of the system and services is very important to avoid upcoming problems. It is a good idea to involve the staff in the phase of testing, so that everybody gets the feeling to be part of the project. It is much easier to get the full cooperation of the staff for services, which are focused on sending (online) information to the customer than to change complex systems of billing and accounting.

- Lack of available organisational staff (CRM, Marketing, PR)
 - Most of the utilities have a lot of external support of various institutes, consultants or agencies, so the lack of available staff is no problem there. On the other hand, in Austria, the project had been managed by internal manpower only. As it is a (typical) project, the staff has to do the daily business and other projects as well.

In this case, the permanent support of the general staff helps in setting priorities concerning other projects. As long as there are not too many persons involved at the beginning and/or a really good and coordinated internal planning is underlie, this lack won't be to significant.

- Other management priorities
 - This can happen every time and can NEVER be avoided.
- Change of environment (market liberalization)
 - Especially in France and Italy, the utilities are now confronted with a change of the environment. The energy market is changing, from monopoly system to a market liberalization. This competitive environment is definitely not yet in the culture of marketing.

In Italy, the project has been done by the DSO because the retailers do not dispose of the data from smart meters. As a DSO service (because of actual Italian Regulation), the retailers' fiscal billing systems were not affected. Smart metering system needs for improvement, especially for what concerns data granularity for energy footprint issues, is currently under discussion at Authority and stakeholders level and will be regulated soon: IREN strategic decision is to wait for Authority decision.

IREN found severe difficulties in engaging DSO Clients on the Project; all communication channels have been tested but only few people responded. Two main reasons could be reported: 1. DSO does not usually talks directly to Clients, Retailers does; 2. Clients' lack of interest on energy related information/offers if not linked to direct money savings.

3.4 Legislative challenges

As the legal situation in every country is quite different, it is useful to separate them:

3.4.1 Austria

- Legal impediments to operate services as initially planned
 - Opt-in: every customer has to declare that he wants to take part in EMPOWERING project. He has to give his consent to process his data like it is described in the declaration of usage. Without his agreement no data transmission and processing could be done. Compare to other countries (utilities), where you have to declare your Opt-out, in Austria you have to declare your Opt-in to the system. This leads to another prerequisite like other countries to get a representative number of users.
 - Until now the legal situation in processing smart meter data isn't clear in all details. There are still open questions about data security and the Opt-Out arrangement. To meet these requirements we had to set stronger restrictions to the EMPOWERING project at all.
 - To guarantee the privacy of the customers the design of the processes and the scope of the consumption data had become very important. Therefore the 'privacy by design'-precept, which has been proclaimed as one of the main fundamentals of the project, helped us to meet this objective. We precisely paid attention to keep the anonymity of our customers. We also had to guarantee this as a special assignment was given by our CEO at the beginning of the project.

3.4.2 France

- No urgent legislative push which would help drive implementation planning.
- Obligation to reach 90% coverage of residential sector with smart metering is postponed for GEG to 2024, as it is a utility with less than 100,000 clients. Thus major deployment will only start in 2018.

Pressure for implementing Informative Services is from the market, but mainly for non-residential customers.

Regulated tariffs for non-residential will disappear in 2016 – competition increases. (tariffs were fixed by the state).

For residential customers there is no competition for the moment – so the company will comply with regulation.

3.4.3 Italy

- Conflicts with legislation & necessary changes: the need for more detailed information (meaning also more granular consumption data) about energy consumption to be coupled with money savings and benefits is not feasible at Italian level for Authority constraints. New regulation will be approved shortly overcoming these issues.
- Lack of regulation of data exchange and usage (see point above)
- Data protection constraints
- User consent: EMPOWERING project at IREN is currently running under an opt-out solution for clients.
- If services moved to retailer the service offering might change and customer consent might be necessary

3.4.4 Spain

The regulation in Spain has been in process of elaboration and the project had to deal with:

- Lack of specific regulation for the data exchange between the DSO and the Energy Retailer.
- Lack of officially established procedures for smart meter data validation and data gap filling.

3.5 Unforeseen challenges from utility strategies and environment

A lot of unforeseen challenges appear in every project. In EMPOWERING, we spotted the following points, which have to be considered in a replication.

- marketing actions and technical availability did not fit together
 - In EMPOWERING, the utilities had to set different kinds of marketing actions during the whole project, mainly to get more users into the system. As the technical implementation of the services was not ready at the moment when users should test them, customers got disappointed. With this practical limitation every participating

utility was faced. The reason was that every utility had a different level of implementation and a different individual marketing plan. So common implementation for all utilities was quite difficult.

- Legal differences in the countries, so different roll out and market access
 - The legal situation in every country is quite different concerning the requirements of smart meter technology (e.g. data security, granulation of data, services), billing and the general situation of the separation of the distribution from the retail.

- Service offering approach
 - The opt-in and opt-out situation makes it much easier/more difficult to get users into the system. Opt-in means, that the customer has to declare (by signature), that he wants to use the services. This creates a psychological and technical fold to enter the system. On the other hand, Opt-out, means that the customer is automatically in the system and has to declare if he wants to leave it. The situation concerning opt-in or opt-out, is depending on the advance of implementation of smart meter technology (law, hardware, software, infrastructure) and could be changed permanently.

- Layout of invoice
 - Depending on local legal restrictions, the layout of an energy invoice can be opened or closed for changes in structure, content or styling. This can influence the possibilities for offering the billing services – especially by the energy bill!

- IT-strategy of utility
 - Every utility has its own strategy for using external software and applications. Some are using more external software/applications and are more open to new IT ideas than others which are more focused on their own infrastructure and more IT in-house developments. The EMPOWERING services are only complementary and all internal processes and how to use them are managed by the utility itself. In principle the services would fit to every utility, but it could be a challenge to integrate with sensible for the utility areas such as billing.

- Organisational structure
 - The organisational structure inside the utilities was quite different. Most of the utilities were supported by external service provider, other did it without any external support. Both structures have advantages and disadvantages.

All in all the organisational structure is nearly the same as in an average IT- or marketing project. The challenge is to provide the manpower (especially of IT specialists) for the whole project. This concerns mainly IT specialists, who have know-how in this technology. Missing manpower leads to heavy delays and so the technical implementation does not fit to the marketing action plan any more.

4 Major findings and recommendations

4.1 Major findings

At the beginning you have to define the reasons for the implementation of services. As this will lead the further steps of marketing activities and how much power you have to invest to reach your aim. The result will be the definition of the number of users and how important a high number of users might be. An optimised marketing plan which is focused on the aim of the project will save money and resources. For example if customer loyalty is the aim, a high number of user, permanent support of general management, marketing activities, high quality of services and a monitoring system is quite important.

The figure below shows, the importance of the activities is will be quite low as long as the only reason of providing the services is a legal requirement.

		number of customers	support of general management	marketing activities	quality of services	monitoring
reason for services	legal	unimportant				
	marketing sales customer loyalty etc.	very important				

First Step will be the question “Why do you want these services”!

As you were able to read in the paper, in every country there are different market circumstances existing which lead to different possibilities or challenges in the project. Especially the billing services could be influenced by restrictions and regulations depending on the specific legal situation.

The next step is the definition of the market situation and possibilities of the utility (country)!

As in most utilities a combination of several mentioned reasons are found, you can calculate the importance of the activities by the priorities of your utility. Then you can set up a project plan and get the agreement of general management. Get sure that the agreement and support will hold on the whole project as the more resources (marketing actions, acceptance of staff, funding...) is needed the more support of will be needed.

Next Step will be project plan and the PERMANENT support of general management!

The definition of services will be the conclusion of the previous decisions and even the analysis of new aspects focused on technical matters. For example: is there a need for a big data centre, or can everything be done in house? The more services are offered with 1/4h-values the more a big data centre is requested. In this case there will be more technical staff with special skills needed.

Start with simple (not complicated) services, which can be understood by the customers. Complex services won't be honoured by customers. Additional more complex services are easy to implement later, when system and especially the interface to big data centre works perfectly.

The surface and usability of the services, layout is more important than the quantity of services – make less, perfect working, good looking and simple services so customers can understand them easily. Remember that the services will not generate a high quantity of user.

Remember, that an IT-Project, is a long term project and cannot be switched off easily.

Next step will be the definition of services!

The organization of the project should be as small as possible, as long as you have permanent support of general management. Usually two or three persons of the IT and marketing/sales department should be involved. The project lead should be at the retail department depending on the level of liberalization, can it be the DSO as well but not preferred. The number of participants in the project group will increase when the widespread application will come closer. When general management support is decreasing, it will be necessary to get more support by other departments but in return there will be more influence and more delays.

Next step will be the organization of project!

As in every project the finance is important, just a few hints to avoid a lack:

- As long as you keep an eye on your project plan incl. finance it will be a success.
- More complex services are in the need of more support and more IT-manpower.
- Setting new and/or more intensive marketing actions do not lead automatically to more users.

Next step will be the setting of marketing actions!

As already mentioned several times, the marketing actions are depending on your aim and actual market situation. As long as you are in an opt-out situation and offering the billing tool (sending services with invoice) it is quite easy to reach customer. On the other hand it is much more complicated to bring a customer in an online service system. Possible marketing activities are in

the list below but the expectations could be higher than the results. Our experience in the project was that a personal direct mailing to your target group in combination with an easy access (registration) to a perfect working system in an appealing environment could be the best way to attract the customers. Still keep an eye on the technical implementation so that all services work perfectly before you start any marketing action. Additional advantages could be the combination with other projects so you can use other channels and save money.

Possibilities for marketing:

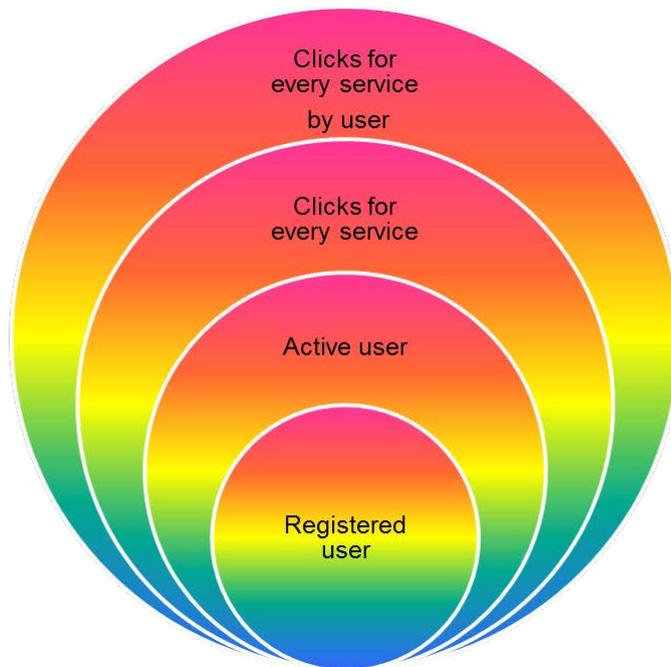
- General information (homepage, newspaper...)
- Direct mailing (all customers which can use the system – online)
- Direct mailing – other matter, with additional information
- Billing (information on the invoice and/or with the invoice)
- Questionnaire, surveys.... – avoid too many of them (it takes time, resources and is boring customers)
- Call-centre, as complains are coming up to consumption, you can inform them about the services
- Combination with other marketing actions.

As a lot of marketing actions have a quite similar topic, it will be easy to combine them (e.g. new smart meter tariff campaign could be linked to EMPOWERING-services)

Next step will be the implementation of a monitoring system!

To see the result of your activities it is necessary to implement a monitoring system. At least the number of registered and active users should be evident to see the increasing or decreasing number of users of the system. So it makes sense to monitor the active user and their activities. In this way you should check, how often the system has been entered. This is the first step to see the interest of the system. Next step is the monitoring of each service, so you can see if the service is interesting for the customers. Finally it makes sense to identify the customers (e.g. by contract number) to see, who is interested in which service. This helps you to evaluate all services by customers. We were able to see that most of the clicks have been done by the same users. These users are mainly the small group of energy “freaks” who want to know everything about their consumption. The normal customer is mainly interested in a few very simple services which are explaining their consumption (especially in a graph) in detail to confirm or refute the invoice.

Unfortunately this simple IT-method cannot be used for billing services by invoice. Therefore personal questionnaires are needed to get a feedback by the customers. Especially quite close after starting the services (e.g. “how do you like it”, “what can be done better”) and after changes of the services it does make sense to do this. The easiest way here is to listen to your customer care team as they are explaining invoices and getting feedback permanently.



4.2 Deviations

In France, Austria and Italy it was not possible to provide the billing services. This would mean a full integration of Empowering in the billing/invoicing tool. This is founded in the sensibility of billing in an energy company, as this is the most important part of the utility and the integration of another system is causing a lot of unforeseen challenges. So utilities do have to find other solutions to offer billing services. Furthermore billing and invoicing are subject to a lot of legal restrictions so utilities are not able to change the design, layout or level of information of an invoice!

These dual developments were causing challenges for the IT-staff, as two or more systems have to be supported. In France even the purchasing policy was causing challenges, as the contract for the insight engine did not fit to the public procurement act, as GEG is subject to it.

The online services did not reached the expected number of user. Even due to the massive use of various marketing actions the results are much lower the expected performance. Reasons are listed below. For further information you can read the paper in detail.

Reasons for low number of user (online services):

- Marketing plan and actions did not fit to the technical implementation of the services.
Various mass media actions have been started to increase the number of users. Unfortunately the system did not work at this time, so users were not able to enter system. Customers are trying to enter an advertised system only once and the power of advertising ends quite soon. So make sure that system is working perfectly before you advertise for it.
- Complex and multiple way of registration.
Sometimes the registration to the system has been made quite complex (multiple registrations, acceptance of various agreements...) so customers gave up after a while. So shape the registration as easy as possible.
- Psychological border of online agreement for personal data transfer due to various restrictions (privacy, data protection) and the fear of transparency of privacy.
This challenge appears with all online services and the only way to weaken this fear is a credible briefly statement what you are doing with the personal data of the customer.
- Opt-in situation as customers have definitely sign to the system.

4.3 Lessons learnt

1. Billing services by invoice is the most effective way to reach customer (as long as it is possible by legal restrictions and you are in an opt-out situation)
2. Online services are mainly used by energy-experts and won't be a tool for mass customers.
3. Responsible department within the utility should be the retail department as it is the face to the customer and the owner of customer data base!
4. Take care on the resources of your technical (big data) specialists!
5. Take care for support of general management (permanently).
6. Keep an eye on your cost situation!
7. Many services do not cause many users!
8. Offer simple services, which are easy to understand!
9. Do not set high cost marketing actions, as it is no guarantee for high number of users!
10. System/services have to work perfectly before you go online!
11. Set marketing actions only if system works perfectly!
12. Use monitoring of user AND services to evaluate the system/services.
13. Do a good market analysis to define your aim, services, legal situation, technical possibilities, marketing actions and even the general opinion of the customers to energy savings!