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# ENHANCING USER EXPERIENCE THROUGH PROSUMPTION IN THE ERP SYSTEM

## Introduction

Looking through computer science literature, prosumption is always described in the context of Web 2.0. Web 2.0 philosophy fits perfectly into the idea of self-production of new products (content, media, etc.) by consumers. Surprisingly, only a small fracture of computer science publications are related to prosumption. Not to mention its business supporting application/role.

And yet, as R. Kitchin i M. Dodge say: "Software has deepened and diversified participation by enabling people to interact with, customize, and accessorize a wider range of services, media, and products; to move from being a consumer to a prosumer in more realms of everyday activity" [KiDo11].

Unlike the Internet, where together with the phenomenon of mass communication comes mass production, traditional user produces almost exclusively for himself − satisfying his own needs.

In case of this publication we concentrate on supporting users of the ERP system in executing tasks, which comprises preparing analysis, based on the data taken from SAP Business One (further referred to as 'SAP B1'), an OLTP class information system. Simplification of the process of preparing and executing analysis of the transactional data helps with fulfilling users' needs. According to Hassenzahl et al. needs fulfillment is one of the main assumptions of many user experience (UX) models in context of Human-Computer Interaction (HCI) [HaDG09].

This publication aims to present the ways in which an individual can improve his/her performance at work. We want to present how prosumption affects a process of decision making through increasing user's commitment to process of data analyzing. We postulate that prosumption leads to enhancing user experience related to using analytical tools.

## User experience

The concept of user experience (UX) is part of the research field, that covers the interaction that occurs between the computer and the user (e.g. human computer interaction – HCI).

It can apply to both, in a narrower sense, the experience of a person using a specific artifact (e.g. system), as well as cover all feelings that result from contacts with the company, including its products and services [NoNG].

The term 'user experience' is ambiguous. It can be interpreted in different ways, such as: usability, aesthetics, pleasure, feelings related to technology used [HaTr06]. In 2008 Law et al. conducted a study to determine how the term UX is understood by people who are professionally connected with this subject. Among the respondents there were both practitioners, using knowledge about UX in their work, as well as people doing research in that area. The researches selected five definition of the term UX. The choice was made based on differences in perspectives on UX presented in the definitions and different attitude to the five elements, encompassing the meaning of UX [LaRHVK09]:
- focus: the main concern to be addressed,
- who: the experiencing agent/subject of interest,
- what: what is the something/object that is experienced,
- how: how is the experience brought about,
- when: three possible states: before, during and after interacting with the object being experienced.

According to the results of the above mentioned study the definition that was chosen most often as best reflecting the sense of the term was one provided by Hassenzahl and Tractinsky:

"A consequence of a user's internal state (predispositions, expectations, needs, motivation, mood, etc.) the characteristics of the designed system (e.g. complexity, purpose, usability, functionality, etc.) and the context (or the environment) within which the interaction occurs (e.g. organizational/social setting, meaningfulness of the activity, voluntariness of use, etc.)" [HaTr06].

## User experience in data analysis in the ERP system

Working with data analysis technology is always a challenge for the user. On one hand, it's related with the need to learn complex and sophisticated tools, on the other a large amount of information needs must be satisfied. User hardly has the ability to produce new content with a classic ERP system (we're not talk-

ing about the data entry). His work boils down to generating predefined statements or reports and drawing conclusions. Thorough analysis of the problem requires not only the access to large amount of data but also creativity and often outside the box approach.

ERP predefined reports often present data in a standard way making a deeper analysis almost impossible. Designing custom statements or reports is often impossible due to the need of expanding the system with optional reporting tools. Those tools are ignored in the standard implementation of the ERP system for multiple reasons.

In Poland, the lack of user involvement in data analysis process can also be explained by a relatively low awareness of senior management, regarding the existence of appropriate tools/technologies and their usefulness (read: influence on company's financial results).

However, the most serious obstacle is the cost associated with staff training on new tools and technologies. Currently, due to changes in the knowledge and skills of executives an increased interest in the analytical tools is seen in the segment of small and medium-sized enterprises.

In the case of an ERP system it is very important for users who use it, that they can do it quickly and at the lowest possible effort associated with the exercise of the functions. In order to achieve these objectives an ERP system must provide the user interface of an appropriate quality, which will positively affect the UX. Among the elements that affect the UX we recognize:

1. Logical layout of functions – similar functionalities should be available close to each other – grouped in sets.
2. Lucidity of the interface – can be reached through applying appropriate color and fonts.
3. Ease of obtaining information on how specific business process is being implemented – determined by the existence and ease of use of system manual.
4. Ease of obtaining information on what are the consequences of executing specific functions – every user should be able to easily get information on what's going to happen when he uses the specific function.

In the long run the course of changes applied to the user interface should be taken into consideration as well. Sustainable development of the interface is needed instead of revolutionary changes, so the users of an ERP system were not overwhelmed with the changes being applied.

## Analysis of transactional data

One of the most popular data analysis tool is Microsoft Excel. Due to its popularity, most of the other analytical software is based on its interface and functionality (using the idea of a spreadsheet as an interface). It is dictated by the fact that MS Excel users largely act as prosumers: creating templates, checklists, analysis, etc. which they later use as a template for future tasks. The level of experience of such users is so high that manufacturers want to provide them with a familiar interface, rather than convincing to something new. In addition to standard applications, MS Excel is often used as a last resort in situations where a lack of basic software functionality (ERP system) makes a specific task impossible to complete.

It should be noted that performing analysis based on a larger amount of data requires great knowledge from the user (the ability to connect to relational databases) or a lot of patience (exporting data through reports and statements). In both cases, the risk of failure is so high that analysts generally avoid performing such analyzes without adequate support. Products which extend MS Excel capabilities with a data access layer to ERP systems are becoming a real alternative.

XL Reporter is a reporting tool directly connected with a relational datasource. Fully integrated with SAP B1 interface, XL Reporter allows user to run a report directly from the SAP B1 menu. Based on user parameters, it displays the data directly into MS Excel spreadsheet. In case of such software one of the most important success factors (ease of use by users who are not developers) is a data access interface.

XL Reporter works in three different modes of operations: report organizer (RO), report composer (RC) and report designer (RD). RO is designed to enable user to manage reports' definitions − give them names, plugging them into SAP Business One menu, schedule running the reports – all of it without any IT knowledge. Similar situation takes place when it comes to work with Report Composer. Report Composer offers the possibility to use a menu, which helps users in making a choice of which business area the report will take data from and what dimensions and measures to include in the preparing report. In addition the user can use a 'drag-and-drop' option to select appropriate dimensions in a way similar to working with pivot tables.

Figure 1 presents a screenshot of Report Composer window. In this case we assumed that SAP B1's user wanted to know what are sales numbers for the specific sales person with regard to a warehouse and displayed by customers, items and financial period. Dimensions, such as salesperson, customer and item and measure: amount of items sold were dragged from upper part of menu and dragged to the report data area on the bottom of screen. The selectors – warehouse and period were dragged to the selection area.
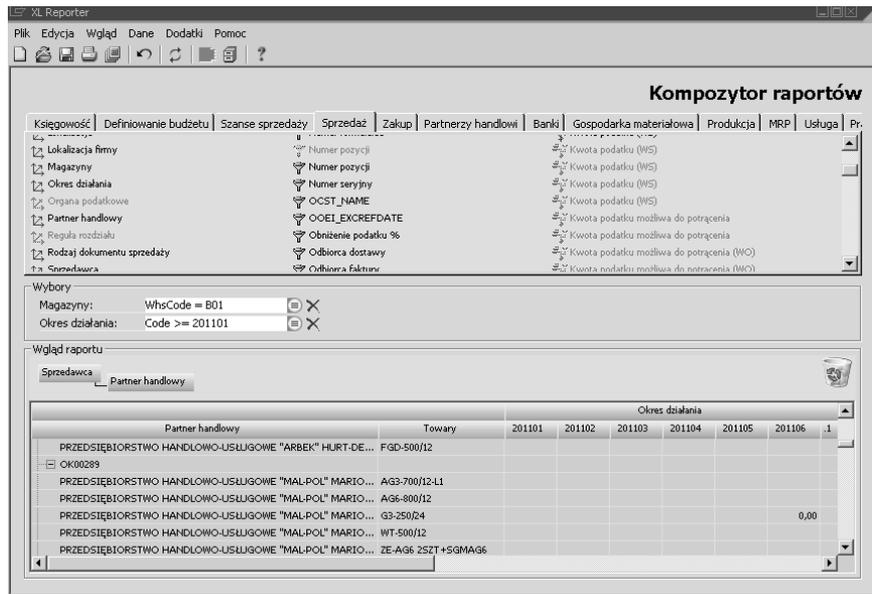
Fig. 1. Report Composer in XL Reporter

After creating the report definition user has the opportunity to continue its processing in the spreadsheet – MS Excel. User can use all of MS Excel functions in doing so, as well as use the XL Reporter menu, running directly in the spreadsheet. The XL Reporter add-in enables user to include parameters in the report and enhances the selection of data being analyzed – Figure 2.
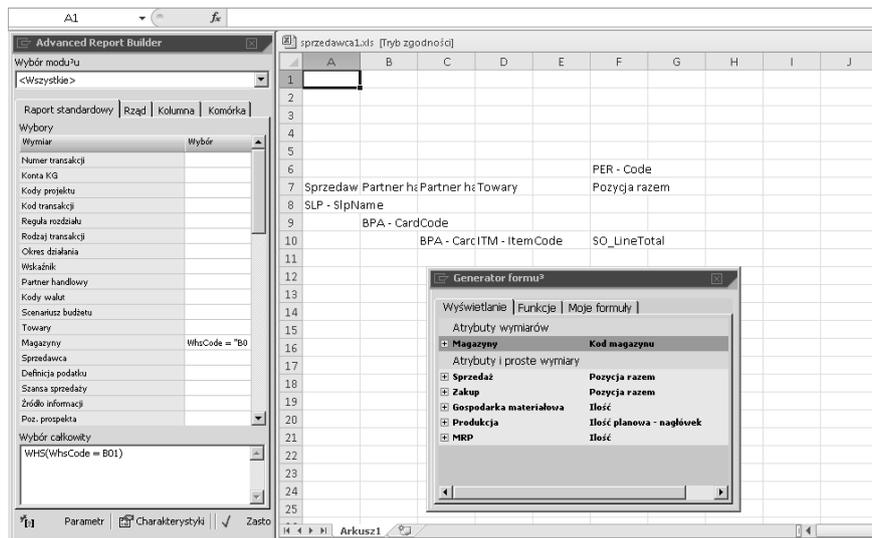


Fig. 2. Advanced Report Builder

The knowledge that is needed to effectively use this tools doesn't exceed the business knowledge. Thus users of Report Composer become the active prosuments – producers of statements and reports, which are further used by themselves, helping them in accomplishing common tasks related to data analysis.

## Multidimensional data analysis

A much easier data access is provided to the user by Business Intelligence tools which are based on multidimensional structures. In accordance with best practices for implementing business intelligence systems (BI), one of the key element is to gain user's trust. The trust concerns accepting the sense of changes and purposes which BI serves. It then translates into user engagement and the quality of decisions. The trust itself is gained by offering the opportunity to create personal analysis and sharing them with others. The recipient of content becomes the supplier. Unfortunately, BI modules supplied by the ERP manufacturers are often too expensive for small and medium-sized companies. Third-party tools might be a good alternative in this situation.

The "BI Studio" platform from Consorg SA is an example of this kind of software. It uses "develop a system in place" methodology and has a proven track of successful implementation in Poland, both in small and medium-sized enterprises as well as those listed on the stock market.

Most of the tools included in the BI Studio package are focused on prosumption − the user can (without much IT support) develop business applications that have been already implemented. XlStudio (Figure 3) offers this kind of functionality. It acts like the XL Reporter − that is being a Microsoft Excel add-in. It uses both relational and OLAP data technology, enabling the usage of multiple datasources (not limited to the selected ERP database).
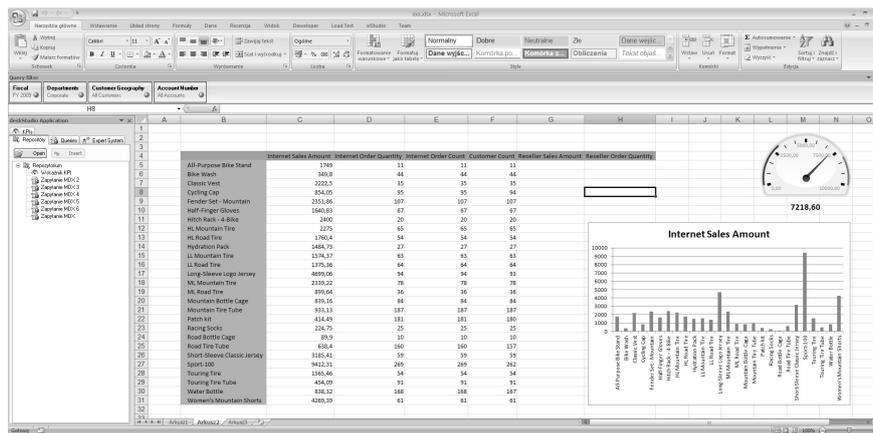


Fig. 3. XlStudio in MS Excel

XlStudio allows its users not only to build and view interactive reports (using drill down, up and drillthru operations) directly in MS Excel, but also binding additional descriptive information and provides an alternative way to enter data through multi-dimensional structures. It extends the range of potential applications with the usage of simulations. The user fetches the data from the ERP system, completes additional information and then using the simulation model created with standard MS Excel functionality saves the results back to the transaction system. In addition, XlStudio is integrated with an expert system enabling the use of the results as another data source.

## Manager cockpits

Further ERP data processing gives multiple possibilities and variety of applications to the user. However, the biggest prosumption activity can be observed in a situation when a user builds his own user interface. A popular scenario would be designing a management dashboard where a certain analytical problem can be visualized instead of just generating single reports. Although creating dashboards can be very intuitive and straightforward it requires more experience and analytical knowledge from the user. It involves mixing different types of content and present them in a user friendly manner. Depending on the recipient a text description would be an appropriate presentation, others (accountants) prefer tabular data or even charts or graphics (managers).

One of the key innovations delivered in the new version of SAP B1, version 8.8 was the change of the user interface. There is still a possibility to use the old layout, well-known from the previous versions of SAP B1. In the old, so-called 'classic' menu style user worked with menu, grouping similar functionalities in modules – Figure 1. In the new style of menu user can display functions in cockpits which are the containers for widgets. In other words cockpit is a single workspace which can be populated with different widgets according to one's needs. Widget, in turn, took the form of windows placed within the cockpits. There are several kinds of widgets, each one serving different purposes: list of frequently used functions, alerts, internet browser.

Prosumption appears here when user of the ERP system starts to freely compose the workspace within the system. User can observe his own actions in the system and gains experience. According to the learning theory people gather knowledge when they are able to make critical reflection on their experiences. We assume that user is able to and based on that knowledge he can make decisions about the composition and look of his workspace.

Especially interesting is the usage of common functions – users can build their own menus (within widgets) and decide which menu would suite them best for realizing specific tasks – using cockpit's functionality.
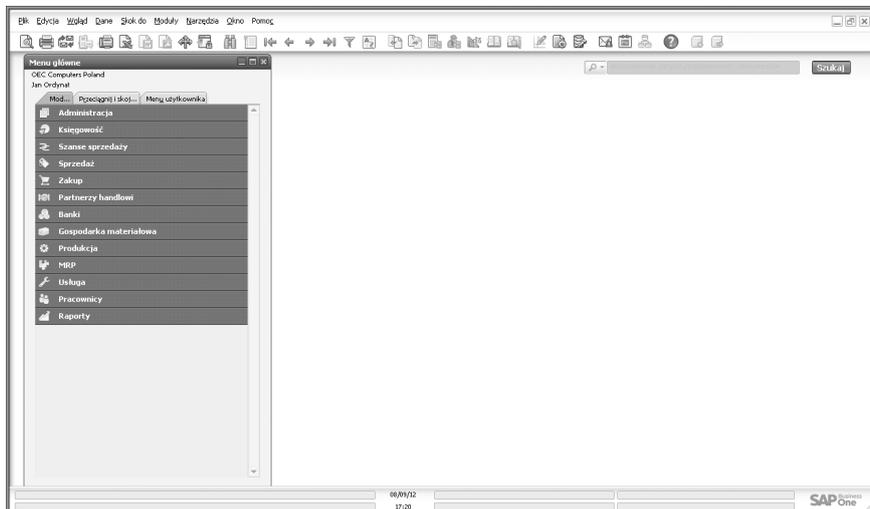


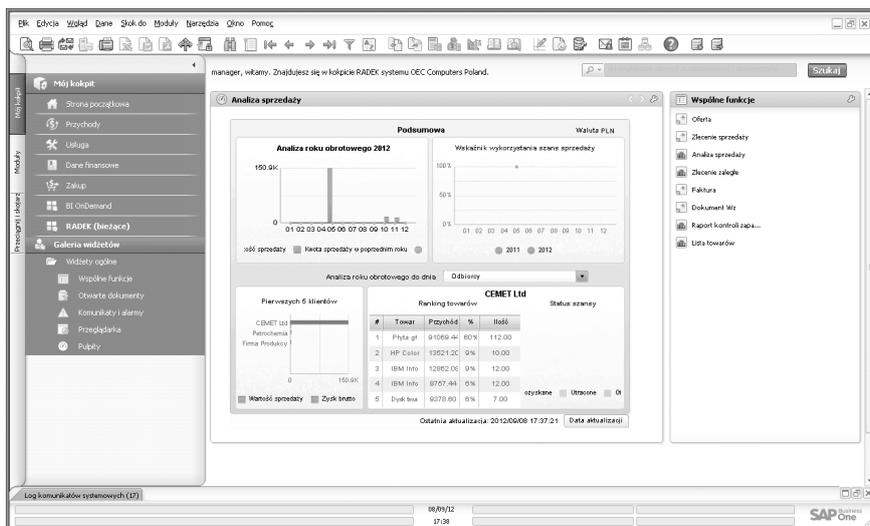Fig. 4. 'Classic' style of menu in SAP Business One



Fig. 5. User's cockpit and widgets in SAP Business One

As a result working with the system resembles a work with Web sites, which offer the ability to create user's own widgets composition – (cf. http:// iGoogle.com).

There is a web browser available among other widgets, what increase the range of possibilities for SAP Business One users in the area of customization the interface to better suit their needs. The browser can be used to integrate SAP B1 interface with other solutions, for instance one of the online analytical tools.

The novelty in the ecosystem of SAP solutions is a service called BI OnDemand. This service helps users with minimum or none knowledge on information technology to prepare data analysis on their own. All that has to be done is to prepare a dataset with data taken from SAP Business One database and upload it to the server. Because this service is provided using SaaS model (Software as a Service) users access the prepared analysis using internet browser, such as IE or Mozilla Firefox. Thanks to that this offer is especially important for mobile users – a group of users which is growing very fast lately. When dataset is ready at the BI OnDemand platform user has a number of tools which enables him to prepare more advanced analysis or apply an previously arranged visualization. What is also very important the platform offers the ability to share analysis with other users.

More advanced users have to use independent software vendors solutions. Designing an interface using external data creates data access problems. Companies that have chosen to implement BI tools often receive tools for creating dashboards. Referring to the previously mentioned platforms, WebStudio from Consorg is this kind of a tool – Figure 6.
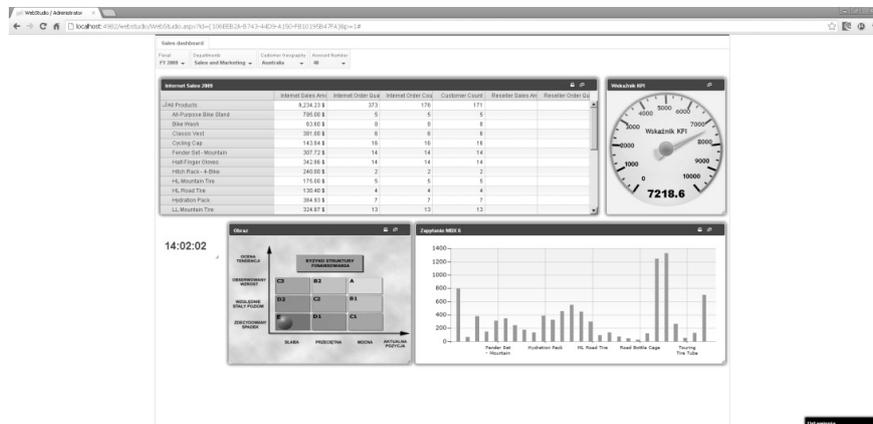


Fig. 6. Dashboards in WebStudio

It provides a user friendly interface for creating and publishing dashboards both for group and individual users. It also gives the ability to create custom multidimensional queries, which can be later converted into charts or KPIs. The

biggest advantage of the solution is the ability to design interactions between objects. The prosumer is responsible for the content, appearance, and behavior of the dashboard. As a web-based solution it also allows for integration within a single dashboard of content from various datasources (including external − web sites).

## Summary

This paper concentrates on supporting an ERP system user in executing tasks related to data analyzing. Because making the analysis in the ERP system affects the overall experience about this system we draw a conclusion saying that when user can engage himself in the process of preparing data analysis such fact can positively influence his user experience. More and more critical publications concerning prosumption can be found over the Internet, where it is often just an excuse to make money of others' people work. This raises the question whether the idea can be used in traditional prosumption business so that it is done for the benefit of both the employee and the company. The answer is yes and a confirmation of this thesis can be found in EMC Corp. report, where prosumption is shown as on option for the user to create his own analysis. It also affects the quality of work with an analytical tool and its effectiveness.

"The end-user perspective must be an integral part of the effort from the very beginning. By allowing the end users to shape the solution, the true business requirements are met more effectively. This results in a higher adoption rate and subsequent broader use of the tools" [EMC10].

When it comes to enhance UX it seems, that facilitating user creation independent analysis allows on the one hand to increase his satisfaction with using the ERP system, and on the other hand it increases the effectiveness of his work. Such effectiveness is here understood as matching the results of work to the expectations that were formulated about these results before the work began. User changes the way he participates in the process of data analysis – from passive receiver to active producer. That's how prosumption takes place and how it increases user experience. An ERP user who acts as a prosumer acquires experience that pays off later on. Initially he is able to generate standard reports, than he learns how to create custom reports, and eventually is able to build a complete analytical platform based on dashboards. Activities that were initially supposed to help him work expand among a group of colleagues for whom he provides content. Expanding his experience as a user, increasing its effectiveness as an employee at the same time benefiting the company he works for.

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## WZBOGACENIE DOŚWIADCZEŃ UŻYTKOWNIKA DZIĘKI PROSUMPCJI SYSTEMÓW ERP

### Streszczenie

W artykule opisano możliwości wspomagania pracy użytkownika systemu klasy ERP w wykonywaniu zadań, które obejmują przygotowanie analizy danych pobranych z systemu SAP Business One. Przedstawiono sposoby określające, jak użytkownicy systemów informatycznych mogą doskonalić wykonywanie codziennych zadań. Wykazano prawdziwość tezy, że prosumpcja oddziałuje na proces podejmowania decyzji i zwiększa zaangażowanie użytkownika w analizę danych biznesowych.