Integrated Campus-Portal

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Abstract. In this paper we describe the campus-portal which is established at the Baden-Wuerttemberg Cooperative State University. The bases of the portal is MS-SharePoint. In the portal all central administrating systems, as student adminstration, evaluation, customer relationship, alumni-management, eLearning and reporting will be integrated soon. Furthermore we will describe a process-management, which will be realized by the workflow-component of SharePoint using functions of different central systems in one process.

Key words: IT-strategy of universities, Portal, MS-SharePoint

1 Introduction

The Baden-Wuerttemberg Cooperative State University (DHBW) was founded in 2009 and accrued from eight educational-facilities, which were called Berufsakademie. In the year 2009 they were converted into one university.
As there are many different structures, especially IT-structures, it is a challenge to harmonize them.
At the moment there are three central software systems. There is one intergrated system, named DUALIS[1], to administrate the basic claims data of the students, the lecturers and the companies[2], the ressource planning of lecturers and premises, the timetable planning, the administration of all exams and the credentials. DUALIS has a rich-client, which allows to use all functions of the system. This client is only in a few parts configurable for different groups of staff. Additionally, there is a web-client for some self-service functions for students and lecturers. In Fig. 1 the architecture of DUALIS is presented. Beside the rich-client and the web-client there is a *portal-client*. This client is in development and should integrate DUALIS into the SharePoint (cp. Section 5.1).

A further system EvaSys[3] is used for the student evaluation. The client of EvaSys is a web-client.

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[1] Campusnet, Datenlotsen Hamburg
[2] At the DHBW all students are additionally members of a company, where they make their interships
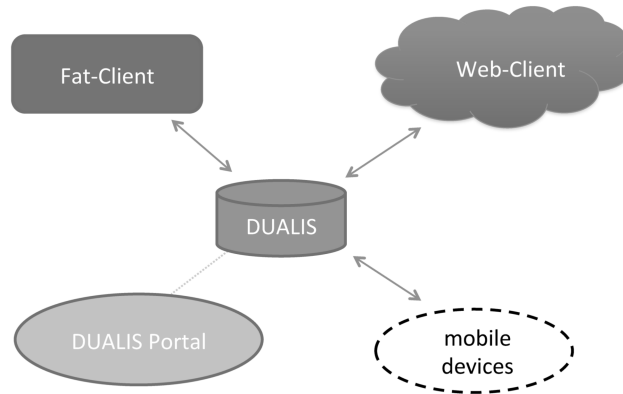[3] Electric Paper Evaluationssysteme GmbH
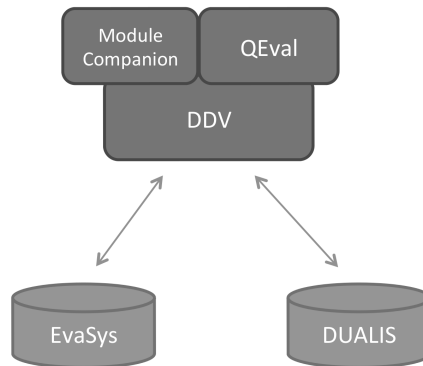
Fig. 1. DUALIS architecture

Fig. 2. **D**ualis **D**ata **V**isualizer

For the reporting an in-house development tool is used, which is called **D**ualis **D**ata **V**isualizer (DDV). The tool bases on jreport[4]. At the moment reports of the DUALIS database and the EvaSys database could be used by DDV. The client of DDV is a Java rich-client. For the DDV-architecture compare Fig. 2. There are two applications, which use DDV. On the web-site of the university the module companion ist presented, where the data base is in DUALIS. Additionally an application *QEval* uses the data from DUALIS and EvaSys to generate automatically evaluation reports.

Two additional central systems are prepared to be introduced soon. On the one hand a CRM-system MS-Dynamics will be introduced. In the CRM-system three groups of customers will be adminstrated: potential companies for the student's

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[4] Jinfonet Software

internships, potential part-time lecturers and student applicants. The client of MS-Dynamics is also a web-client.

On the other hand an alumni-tool will be introduced. The university decided to use the alumni-tool of the company Datenlotsen, which is implemented as a part of MS-SharePoint.

In the future some more central software systems should be launched. At the moment an e-learning strategy is developed. Probably, Moodle[5] will be selected as the standand e-learning tool for the DHBW. Then a central instance of Moodle will be implemented. Moodle has also a web-client.

Finally, a central email-tool will be established. The tool will be MS-Outlook as the client and MS-Exchange as the server. Microsoft offers two different clients. There is a rich-client and a web-client.

Additonal MS-SharePoint is introduced as the software for the DHBW-portal. At the moment only the communication functions of SharePoint are used. The central intranet and intranets for all locations are implemented on the SharePoint platform. Additonally there is a interchange platform for all central boards and some informations as laws and contact persons are presented.

The paper is structured as follows. In the second part the portal strategy is described, the third section is about identity management in a shared organisation for central systems. After that we give the different possibilities which offers SharePoint to integrate other web-clients. In the fifth section we describe our integrated systems and in the sixth section we present the process-management using different systems. We close by a summary.
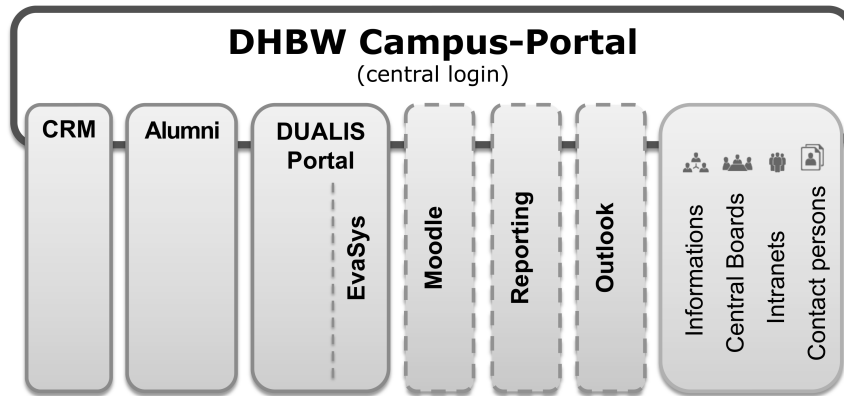

Fig. 3. DHBW Portal

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[5] eLeDia - E-Learning im Dialog GmbH, Berlin

2 The portal strategy

The main goal of our strategy is that the user from the university can reach all central IT-systems from one account on one platform. For this all presented central application should be intergrated to the portal. In Fig. 3 the DHBW campus-portal with a central login is presented. On the right side the standard functions of SharePoint are realized. The blue coulored parts show the applications that are beeing integrated in 2014 and 2015. The reporting system should be realized in 2015 too, Moodle and Outlook will follow.

3 Identity management

Identity management describes the management of user data and defines the authentication and authorization to the systems. Normally each identity is mapped to exact one person, but a person can have several identities. More and more organisations tries to reach a one-to-one relation user to identity. This means that the user has only one password for all systems and in all systems the attributes of them are the same.

In the case of DHBW all 12 campus are responsible for their identity management. Therefore it is a challenge to guarantee authentication and authorization for the central systems. This is a typical situation for universities. In our context the locations are the de-central organisation-units, while faculties are comparable the de-central organisation-units for other universities.

3.1 Active Directory Federation Service (ADFS)

In [1] the ADFS is described in general and the integration with SharePoint technologies: *ADFS provides an identity federation solution for organizations looking to share identity information with their partners in a secure manner.* In our situation not the partners, but the locations share identity information. ADFS works like this: If a user of the organisation-unit **B** wants to login to a web-application of the organisation-unit **A** the ADFS of **A** sends a request to the ADFS of **B** to authenticate the user.

Furthermore ADFS allows single sign-on, which means, that a user needs not to authenticate them multiple for using different web-applications.

4 Possibilities of SharePoint integration

In Jose Barreto's Blog [2] nine different kinds of integrating SharePoint with other web-applications are presented. We will look in detail on three of them, which are used in our portal.

4.1 Link

A simple way to integrate one web-application to another is providing a link. In combination with the single sign-on of ADFS this could be a an integration, where the user do not feel leaving one applications and entering another application. The realizisation is very simple.

4.2 IFrame-integration

An IFrame is a HTML-element which allows to display a web-site in another web-site. IFrame-integration in combination with single sign-on via ADFS allows to present multiple web-applications in one web-site. Adversely, often the screens are too small to present the comlete application and the look and feel of the systems differs often.

4.3 Web-Services

The W3C consortium describes a web-service as follows: *A web-service is a software system designed to support interoperable machine-to-machine interaction over a network. It has an interface described in a machine-processable format (specifically WSDL). Other systems interact with the web-service in a manner prescribed by its description using SOAP-messages, typically conveyed using HTTP with an XML serialization in conjunction with other web-related standards* [3].
Another approach are the REST(ful) web-services. REST (Representational State Transfer) is no standard itself. It is an architecture style, which uses URI's (Uniform Resource Identifier) to identify the ressources and the methods of http to send messages.
In the framework of SharePoint web-services could be used to call functions of different applications.

In combination with the workflow features this becomes a powerful tool. We will call this the *Workflow-integration*.

4.4 Workflow-Integration

As functions of different applications can be called by web-services, in SharePoint workflows can be modelled with functions of different applications. This means that it is possible to define workflows over different systems, such that the user knows only the process, but not the concrete system, which is used.

5 Integration of different systems into the campus-portal

In the following we will describe the integration of our central systems into the portal. This means for the users that they can use all system in one framework.

5.1 Integration of DUALIS and EvaSys

The standard web-client for students and lecturers (cp. Fig. 1) is integrated into SharePoint by an IFrame-integration. It is offered by the company Datenlotsen as the so called Portal+-license. This is the base of the DUALIS integration into SharePoint.

Additonally, an integration of the most important processes of studies und teaching into the portal will be done. The integration is done as a workflow integration. For this all processes of studies und teaching are modelled in a process companion [4]. In appendix A a cutout of one process, the *planning of lessons*, is presented. Altogether 52 processes are identified.

Ten process groups are selected to integrate them into the portal:

No.	Process	User
1	Planning courses	head of department, secretary
2	Course evaluation (with EvaSys)	head of department
3	Students enrollment, exmatriculate and grant students leave absence	secretary
4	Relations adminstrating (students ⇔ companies)	secretary
5	Fees adminstrating	adminstration
6	Remission fees	adminstration
7	Recoveries of amounts verifying	adminstration
8	Salaries und contracts accounting	adminstration
9	Grates typing and unblocking	lecturers, secretary, head of department
10	Transcript of records, creditials providing	secretary

These processes will be implemented as SharePoint workflows. The basis of this implementation is the process modelling in [4]. The important benefit in comparision to the rich-client is that the SharePoint-client offers a workflow driving. This means that the staff need not to know the correct sequence of the process steps. They are driven by the system.

5.2 Integration of CRM

The CRM-tool MS-Dynamics has a web-client. Therefore we will realize a standard integration as an IFrame-integration. This means, that all functions of MS-Dynamics can be used in the portal and the look and feel is the same as in MS-Dynamics itself. For the start of CRM no additional authentification is necessary as CRM is integrated by ADFS into SharePoint.

Additionally, three CRM-processes will be integrated by workflow-integration.

No.	Process	User
11	Adminstration and acquisition of partner companies	head of department
12	Adminstration of lecturers	head of department secretary
13	Students recruitment (exchange platform)	head of department partner companies

Furthermore, will look more detailed into the process 13: *Students recruitment (exchange platform)*. As at the DHBW a student is selected by the company, where the student makes his internships, and not by the university, we will offer an exchange platform to bring students and companies in contact. If a study contract come about between Student and company the data are automatically copied to the system DUALIS. This automatical process brings a great benefit for the university administration.

5.3 Integration of Alumni

The company Datenlotsen offers an alumni-tool as an extension of DUALIS. We decided to use this tools. The great benefit is that the process of exmatriculate a student is extended to the transfer process to become an alumni. For this some protection of data privacy must be considered.
The implementation of the alumni-tool is done in SharePoint, such that no technical integration is necessary.

5.4 Integration of Reporting

Our in-house development tool DDV should also be integrated into the portal, as many processes include the generating of different reports.
In the specification of DDV the requirement was given, that all functions has to be callable as a web-service. Therefore the integration of DDV could be done in an easy way.

5.5 Integration of Moodle and email

Similar as the CRM integration Moodle and MS-Exchange will be integrated as IFrames, as there are standard web-clients, respectively. For some processes also a workflow-integration is planed. Especially for the interaction of CRM and Exchange it is very interesting to use a workflow-integration, e.g. for the recruiting processes, which includes email-campaigns.

6 Workflows using functions of different systems

In the final step the portal should offer workflows of functions of different systems. This means that the user does not know exactly, which is the used system.

As an example we consider again the process of *course planning*. The process ends by the function *make course public* (Lehrveranstaltung veröffentlichen). If EvaSys and Moodle are integrated two things should be done, additionally. First the course in EvaSys should be generated. This means that an evaluation for the course could be done by the students. Additionally a moodle course room should be activated. As in our university normally presence courses are offered, the lecturer should be asked, if a moodle course room should be activated. If the lecturer answers *yes*, the workflow activates the moodle course room and registers the corresponding students, automatically.

The greatest benefit of the portal integration of different systems is, that the user needs to register only once and then the user can work process-oriented. He does not know which system is necessary to do a step of the process. The workflow engine drives the user through the process and the user do not notice which system is used.

7 Lessons learned

It is very important especially for large universities to have a strategy for the central IT–systems. As nearly all central system *campus management*, *evaluation*, *e-learning*, *intranet* and *alumni management* have shared datas, the corresponding systems sould be adjusted. Besides the common data management, the integration of the clients has a great benefit for the users.

At universities often different systems are introduced at the different faculties. It is a great challange to harmonize these systems, as the users are accustomed to use theirs own systems and every new system has beside many advantages also disadvantages in comparison to the old one. It is important to assure users in processes of change. If this is disobeyed, often the IT-projects fail.

8 Summary

In this paper we presented a campus-portal on the bases of SharePoint. All central systems for the university adminstration, as student adminstration, evaluation, customer relationship, alumni-management, eLearning and reporting are integrated into the portal. For the staff this is a great benefit as they need only one application to use all systems.

Additionally we described the implementation of some workflows, which uses different system. This means that the staff can work process-oriented and not system-oriented.

References

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A Processdocumentation: Planning courses

Lehrveranstaltungsplaner (LVPl) [i.d.R. SGL]

Studiengangssachbearbeiter

System

Raumplanung

LV-Plan veröffentlichen — LV-Plan

optional: LV-Plan freigeben — LV-Plan

Ist der LV-Plan OK?

Ggf. in Abstimmung mit dem SGL

LV-Plan korrigieren — LV-Plan

Blatt 2.3

LV-Plan auf sachliche Richtigkeit hin prüfen — LV-Plan

ja / nein — LV-Plan

Raum reservieren

Raum der LV zuordnen

Wenn die Arbeiten auf Blatt 1 (rot umrahmt) mit DUALIS erfolgt sind, dann ist dieser Teil des Arbeitsschrittes nicht mehr erforderlich.

Lehrende der LV im System zuordnen und Verträge für LB erstellen

hier: Vertrag erstellen

Lehrauftrag erteilen (Blatt 2)

DUALIS

Digitaler kalender

Digitaler kalender

Plausibilitätsprüfung im digitalen Terminkalender

An dieser Stelle wird geklärt (VRZ), ob über Planningtool möglich.

digitalen Termin-kalender

Digitaler kalender

der Lehrende wird hier konkret mit Name und Termin eingeplant;

Lehrende für LV einplanen — (LV-Liste)

Blatt 2.2

1. Modulangebot erstellen
2. Im Modul enthaltene Units im Semester anbieten.
Für das Modul gibt es laut Rahmenstudienplan ein oder mehrere Units aus denen sich das Lehrveranstaltungsangebot für ein oder mehrere Semester ergibt
3. LV bearbeiten

(Rahmen-)Studien-plan mit LV konkretisieren

Teilnehmer zur LV anmelden

Blatt 2.1

Alle Termine für das Theorie-Semester (digitaler Terminkalender)
- Outlook
- Complain
- Excel
- Word

digitaler Terminkalender (z.B. Outlook)

DUALIS

Digitaler kalender

An dieser Stelle wird geklärt (VRZ), ob der Studienplan in DUALIS als Planungsgrundlage in einer Planungssoftware verwendet werden kann und ob im Anschluss daran daraus Veranstaltungen generiert werden können.