In collaboration with

# How Karl-Landsteiner-University of Health Sciences (KL) became Austria's first all-digital university

As a new privately funded university, KL's main goals for the implementation of a Student-Information-System (SIS) were clear: Achieve the highest possible level of **cost efficiency** and serve students with the **most convenient user experience**. That meant, **reducing the number of IT solutions** to as few as possible, while still achieving a **maximum level of digitalization**. KL's management was aware of the problems, many universities were struggling with: **Escalating cost of operation**, due to **more and more applications** being implemented while overall data availability was poor – many processes even remained outside the core systems.

Before OpenCampus was rolled out, also KL struggled with managing **many different pieces of software** – not or insufficiently connected with each other, resulting in **intransparency, inefficient workflows and high total-cost-of operation**.

By implementing OpenCampus, KL created a campus management solution that combined various fields of operation into **one single platform**. The whole student life cycle from end to end – including graduate programs - all ERP and HR related features from facility management to invoicing and teacher contract management and the whole fields of research management, including project proposals, budget administration, publications management and even the management of research conferences. This extend of combining SIS, LMS, ERP and research management functionality with one single platform **remains unparalleled** among the competitive landscape.

## The Starting Point

Many of the processes were **not even fully digitalized**. Data was collected on paper and where digital, it was scattered across MS Excel files, MS Access databases and MS online forms - hence there was **no centralized and transparently available definition the actual business processes**, which made training new staff cumbersome and monitoring service quality difficult.

With the launch of the OpenCampus implementation project, **all business process** - until then managed by other software applications or simply with Excel and paper - were **incrementally integrated** into the OpenCampus platform. Starting with the student application and applicant tracking system, which consisted of a simple web form and mainly MS Excel based data management and email communication, the first phase of the roll out provided an **end-to-end online process** in OpenCampus, where prospective students could **apply, get real time offerings** regarding course and study programs, **pay online** for application and tuition fees and follow up about their progress in the application process by checking their status and possible additional tasks on the **applicant's dashboard**. **All communication** with the applicants was managed through the **OpenCampus' messaging system** – which allowed any member of staff at KL to get **instant insight** into each applicant's case, **all documents** including admission letters and official documentation for the applicants were **automatically generated** in OpenCampus and provided to the applicant. The unparalleled ability of OpenCampus to manage highly individual details about each application process – in fact, for any business process – allows to not just manage Bachelor and Master's applications but also **conduct specific PhD application workflows**, including project selections, functionality for referees to submit supporting letters, faculty evaluation committee feedback rounds etc. for which **additional third-party software had to be used in the past**. Similarly for the application process for teachers, that would be hired on a contractual basis to give lectures – usually a task handled by a separate HR/ERP system: these HR processes for teachers and staff are also managed by OpenCampus, allowing them to apply for specific positions, posted by HR, follow a position's specific application track and even **sign their employment contract online** – which is automatically generated by OpenCampus.

Once accepted, applicants can sign their student agreement or decline the offer, simply by clicking a **confirmation link in the invitation email**. If a student declines the offer, this then triggers an automated process to offer the available seat to the next applicant in the waiting list – a **competitive advantage** for the university as available seats can be offered to other applicants in **real time**. Before this process automation, the university had to work with specific deadlines – only if a student had not accepted until the deadline, a seat could be offered to students in the waiting list. But as the deadline was usually weeks away from the moment, other universities would send out invitation letters, the risk that students on the waiting list would have taken a seat at another university was high.

To further motivate the applicants to sign the student agreement early, a **dynamic pricing** model for the tuition fees was introduced. The earlier an applicant would sign, the higher the discount on the tuition fee would be. OpenCampus would **automatically calculate the discount** for each applicant in each study program based on the applicant's position in line and offer the discount to the student.

Within three years after roll-out the number of applications increased by

64%

## The Challenges

As Karl Landsteiner University offers mainly health care education, complex curricular rules and course requirements exist. The curriculum in Human Medicine consists of hundreds of individual course slots in bedside teaching, patient demonstrations, lab rotations, seminars, lectures, online trainings and many more. Scheduling the courses with the commonly limited resources at hospitals and labs can be a challenging task, requiring the KL staff to spend months in planning preparation for each semester before OpenCampus was introduced.

Since the roll out of OpenCampus the planning time for each study program's courses only requires a fraction of the time, as available resources are entered directly to the system from the point of care or service, individual requirements by each student can be retrieved from the system (which student has passed which course and which courses have to be repeated and which courses are suggested for a given term) and the actual planning of the courses – at what time will which course be offered in which room by which teacher with which facilities – will be **calculated automatically** by OpenCampus. The result is a **highly efficient use of available teaching resources** (teachers, wards, labs, materials etc.), **individually optimized timetables for teachers and students** - acknowledging each **student's individual pathway**, even reducing the **travel time** between teaching sites across campuses and hospitals. This led to a significant **increase in student and teacher satisfaction** and even allowed students to **complete their curriculum quicker** as individual solutions could be calculated that considered each student's requirements and availabilities.

Each student has a real time schedule, that shows their **individual lessons for each day** and week and especially in health care, these schedules are indeed **real time** – some courses may be moved or **reorganized dynamically** due to changes in doctors' shift plans, additional patients may be introduced etc. and the schedule may change. OpenCampus will dynamically **inform the student** of the change and update their

schedule and support the course administrator with managing the changes – alerting them of **possible conflicts and suggesting optimized planning**.

But the online schedule is not just providing information about lectures' time, location and teacher, also the **teaching content** (ebooks, files, quizzes etc.) is accessible through this interface as well as **access to third party tools** like Microsoft Teams, Moodle and other learning or learning management applications. KL diverted heavily to online teaching during COVID and had to reorganize all lectures, dividing students into online and in person teaching groups that would alternate to reduce the number of students per class. OpenCampus simplified this change by handling the split courses, reflecting the updated information in real time for all users and providing access to all required online tools (MS Teams, Moodle etc.) from a **single point of contact**: Just by clicking the event in the calendar would redirect to the third party application and sign the user in. Normally, this would require quite extensive work on building APIs to connect to third party software, but as OpenCampus provides an **API endpoint designer**, APIs to third party solutions can be created **within minutes – not weeks**.

## The Reward

Having very detailed information about each course and lecture, the attendees and teachers allowed KL to create **exact reports on teaching times by teacher, subject, learning targets** etc. that offer the basis to create billing reports for teachers and evaluate the effort spent on different learning targets. KL is able to precisely determine how many hours in which teaching format are offered for each learning target – an important metric to improve education using **curriculum mapping**. Connecting the assessment information, that is also stored in OpenCampus – listing all exam questions with their links to learning targets and each student's result linked to these – institutions are able to identify, which learning targets require more attention or which teaching formats should be changed. The exam question database was one of the first features that KL created themselves using the OpenCampus no-code technology. Each teacher would receive an invitation to submit exam questions after their lecture, outlining the learning targets they (should) have covered and defining the number of questions, they should submit. The teacher would then submit questions that went into a review process by the exam committee – all managed consistently within the OpenCampus system. KL extended this process and uses **artificial intelligence to review and optimize the questions** – and meanwhile even each lectures' content. The required plugins to access various AI providers are available from within the workflow engine in OpenCampus.

Integrating artificial intelligence systematically reduced the overall process workload up to

98%

Exam results, grades or the status on course attendance are reflected in the student record, that displays the overview of the student's curriculum, all its requirements and the student's progress to date. But as health care education as the Human Medicine curriculum contain a lot of specific on site training formats, clinical rotations and special types of assessments, **classic grade overviews are insufficient** to track and display the student's progress. What study programs like Human Medicine require, are student records and tracking abilities that can handle **any kind of information**, whether this is an entrusted clinical skills set that describes a student's ability to perform certain clinical tasks, rated by a supervisor or objective structures clinical examinations – in many cases, this information is still collected paper based or scattered across multiple tools and apps, not providing the student or the university a clear picture of the **overall progress and the individual needs** a student has. With OpenCampus' entity based student record, that is able to handle any kind of progress related data we were able to deliver the first **end-to-end Medical student record** that contained all information related to the Medical education progress in a **single interface**.

As initially mentioned, KL not only digitalized the student life cycle in a full and centralized way, also **research management and conference management** were integrated into their OpenCampus platform – by the KL **staff itself without further support by the OpenCampus team**, using the platform's no code technology – allowing the university to **avoid high priced conference management or research management software solutions**. All research projects are managed centrally in the platform, including their staff, budgets, partner organisations, progress etc. giving the institution **real time data** about their research activities, spending and risk assessment. Even the onboarding process for researchers, **health and safety, and lab and ethics briefings** are managed through OpenCampus, as well as all publications and scientific achievement records of the participating researchers. And when planning and managing a research conference, many of the OpenCampus functions are just working together to plan and schedule the event's sessions, register and bill the participants, distribute digital content, issue certificates and manage abstract uploads,  create abstract brochures etc.

KL will **continue to constantly add functionality** in the platform, **substituting third party software solutions, digitalizing legacy processes and accelerating organizational workflows** by the continued integration of artificial technology into the processes. While doing so, the created workflow configurations can be shared with other institutions to support their digitalization approaches by providing them with **ready-to-use digital best practice solutions**. This network effect plays an increasing role in the decision making process for institutions to choose OpenCampus, as a growing number of functionalities – even highly specific ones – becomes available within the framework, which will further **cut down implementation times** and staff's efforts at the institutions.

# Take the First Step

## Contact an OpenCampus Account Manager

## at info@opencampus.com

# Technical Background Information

Based on more than 10 years of experience in the fields of student information systems, learning management systems and enterprise resource planning (often referred to as campus management systems in this combination), OpenCampus proposes to use **existing platform technologies** to achieve the objectives defined in the terms of reference rather than developing a new system from scratch. Since 2011 OpenCampus has been implementing campus management systems in Europe, the UK and Japan using the **same underlying technology** to achieve various different requirements in terms of curricular design, learning pathway creation, course and credit management, assessment creation and execution, reporting, business intelligence and many more.

The technical bases for the approach is using DRUPAL as underlying platform technology, which has proven to be a **modern, secure and versatile environment**, especially suitable for the use in **education**. ([https://www.drupal.org/industries/education#stories](https://www.drupal.org/industries/education#stories)).

DRUPAL provides a multitude of **built in concepts** that make it ideal for its use as SIS/LMS solution, providing a **fully web based** technology, **built-in configurable APIs**, support for multi-language interfaces, an **extendable, module based architecture** and with the entity based date storage model, a technology, that makes it more adaptable to managing individual content than any other learning management platform on the market.

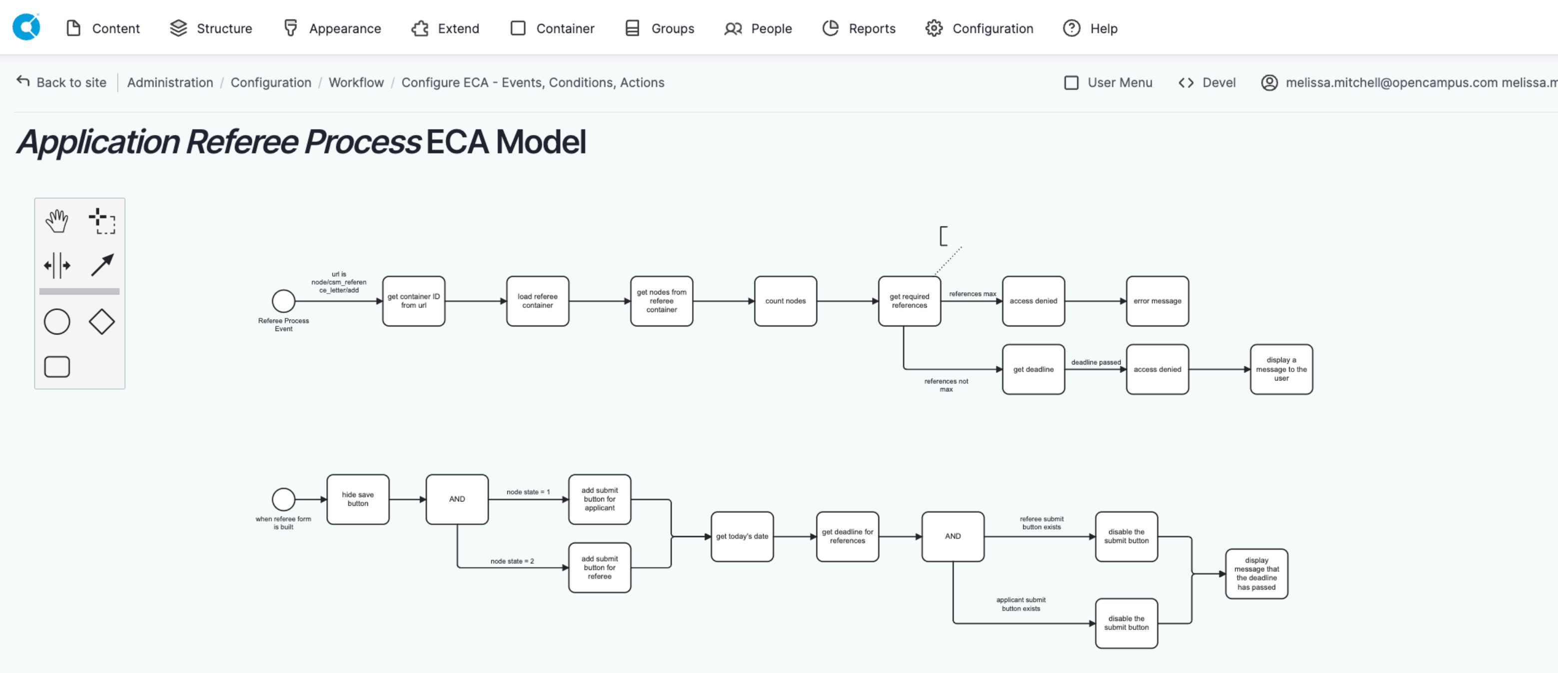
OpenCampus and its partners have developed a configurable workflow and process engine, released as Drupal module ECA ([https://www.drupal.org/project/eca](https://www.drupal.org/project/eca)) which in addition to the powerful base architecture of DRUPAL allows an **unparalleled extent of automation** in the workflow management and **simplicity in configuration**, using a graphical “Business Process Model and Notation” interface. Using this technology, OpenCampus was able to map any curricular requirements across **different verticals in education**, from K-12 education to graduate education in **different countries** without changes or extensions in software code. All functional features and specifications are always **stored as configurations** in the systems, which makes the solution robust, secure and efficient, as **no custom code** has to be maintained, thus **reducing the total cost of operation** to a minimum.

Due to the nature of the platform, being an open source project, **more than 1 million contributor**s constantly extend the system, providing both a **growing set of modules** and a **level of system security** that closed source project are unlikely to ever achieve – making it

the ideal choice for government run sites like the **White House Intranet** or the **House's Intelligence committee** https://intelligence.house.gov/ or countless other government sites https://groups.drupal.org/government-sites. With more than 20 years on the market and powering more than 14% of the top 10.000 websites DRUPAL has proven to be one of the most reliable and scalable web technologies globally.
Many technology and solution providers in the field of education interconnect their solutions with DRUPAL, which makes it easy to use state of the art learning and assessment tools like H5P (https://www.h5p.org) as functional features in the platform, without having to **maintain own solutions** and code, again significantly reducing the cost of operation and also **benefitting from the learnings and experience of a global education technology community.**

Based on these beforementioned technical and structural concepts, OpenCampus has developed a **standardized method** to implementing SIS/LMS solutions with **high efficiency** in terms of human resource usage and overall project time – **cutting down the average implementation time** for a campus management solution from 21 months in Germany to 7 months. The OpenCampus approach is based on the **use of templates** for both, the data analysis phase to collect specification information together with the client as well as the functional representation of the requirements in the software product.

With more than 600 feature configurations existing as customizable **'best-practice-templates'**, SIS/LMS configurations are not built from scratch but created with minimum timely effort out of a fitting selection of best practice templates and then refined to the client's specific needs in a next step. This approach **reduces the overall resource requirements** on both the client's and the provider's side and **improves the quality of the generated solution**, as **well proven concepts** are used as basis for the configuration modelling.
From the client's perspective, a major advantage of this procedure is the **simplification of the requirements specification phase**. As templates are being used, specification details that are technically recommended are already present in the definitions and the risk of missing out on a definition is reduced. Clients find this approach significantly easier than developing a requirements specification fully from scratch, as it also eases the pressure of having to provide highly technically skilled personnel from the client side and the risk of having to integrate change requests later in the project. Still as a **"no-code" technology** is being used to map the client specific configurations, the system's **robustness to integrating changes** in a later stage of the project or even during the productive use of the system is high. Changes or extensions to existing functionalities and business processes can be integrated quickly by adding configurations in the **ECA process engine**, a built-in consistency check will ensure, that changes don't disrupt existing



business process functionality. To keep track of the integration of changes and additional features, OpenCampus suggests a **deployment concept using 3 system installations**, one development system, one staging system and one production system. New features and processes can be created on the development environment and once completed are moved to the staging system. The DRUPAL technology allows to **'package' a configuration**, containing content definitions, process definitions and all other required configuration details into a **YAML file**, that can be installed into the staging installation. On the staging installation, the newly integrated configuration can then be tested using production data – the staging installation represents a copy of the production environment. Once this test has been completed, the identical configuration file will be integrated into the production system. Using this approach of packaging configuration makes it easy to keep track of system features in different versions - the configuration files will be stored and managed in the related **GitLab** project, which both OpenCampus and the client have access to. Configuration packages are linked to a release in GitLab, which provides transparency and simplifies the structuring and deployment of documentation and training materials at the same time.

OpenCampus will provide a project team with a project manager and the technical experts to collect the specification information together with the client, integrate the specifications into the product, provide testing instructions, training and documentation and manage the deployment processes - all in an industry standard SCRUM based development and implementation approach - but will also provide members for a **steering committee**, a separate unit in the project that serves as monitoring and advising entity – a concept that has proven to be beneficial to mitigate project risks in terms of decision making, overall project time and budget management.

Typical features of DRUPAL based SIS/LMS solutions can be reviewed on LMS distributions of DRUPAL like www.opigno.org showcasing a selection of features and abilities like WCAG 2.0 compliance (level AA), pure and completely customizable user interface design, adaptive learning paths, customizable user dashboards,  achievements page for quick progress tracking, seamless experience across devices: “switch devices and resume the course where you left” as well as capabilities like Apache Solr integration, Authentication: LDAP (Active Directory), CAS, OAuth 2, and OpenID integration, SCORM: versions 1.2 and 2004 TinCan (xAPI), H5P, Certified LRS: Learning Locker, Watershed which are just some selected features and capabilities of the environment. For an extended list of features and a testing environment visit https://www.opigno.org/product and https://go.opigno.org/l/976103/2022-10-19/6g1qv

OpenCampus has developed one of the most powerful and extensive technologies to manage curricula design, inter-curricula mapping and content annotations, allowing infinite level curricular designs with complex rules, connections between curricula (national master curriculum as parent tree connected to individual school curricula) and the linking and catalogue mapping of learning resources and learning objectives to these curricula so that each individual users progress can be monitored in reference to resources used, learning objectives achieved and the quality a both the curriculum and the learning resources evaluated using integrated curriculum mapping. The details of this technology are described in US patent US 91703,535 82 which is provided as annex to this document.