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## NON-THEME ARTICLE

# Information management and service integration at German universities

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### Abstract

**Purpose** – Customers do not like to deal with maintenance problems and responsibilities for academic support facilities. They prefer service portfolios that integrate services for an easy and comfortable use. This paper aims to describe the organisational changes needed in the computer centres and libraries of German universities.

**Design/methodology/approach** – The article describes how several German universities are setting up an integrated information management system to improve cooperation between institutions that provide academic support in the areas of information, communication and media services.

**Findings** – The largely traditional support structures of German universities are in transition. The problems and challenges posed by information management and service integration, which Anglo-American universities introduced during the mid-1980s, are now a key issue at German universities and are being tackled with ever-greater energy.

**Originality/value** – This article gives an overview of the current state of information management at German universities.

**Keywords** Information management, Integration, Universities, Germany, Libraries

**Paper type** Research paper

### Introduction

The article describes how several German universities are setting up an integrated information management system to improve cooperation between institutions that provide academic support in the areas of information, communication and media services.

At a conference held in Tübingen in autumn 1991, German institutions working in the field of information infrastructure (libraries and computer centres and subsequently media centres) combined forces for the first time to discuss ways of improving information supply services for researchers and students at universities. In those days the concept of information management was not a central issue. The main concern at the time was to define tasks, delimit responsibilities and perhaps to discuss the question of service quality. Other conferences followed, resulting in the founding of the Deutsche Initiative für Netzwerkinformation (DINI)/German Initiative for Network Information in the year 2000.



One could, perhaps, regard the resulting theses on “Changes in information infrastructure – challenges to universities and their information and communications facilities”[1] as the DINI’s founding charter or programme. Thesis 4 states:

The universities need to establish information management structures to integrate departments. University managements, departments and central institutions ought to prepare a university development plan for the areas of information, communication and multimedia.

In this way, the DINI challenged universities to attach far greater importance to the management of information than they had in the past and, at the same time, to establish a platform within DINI for exchanging ideas in order to realise this goal.

From this background the German Research Society (DFG) started a competitive two-phased program for information management in German universities in 2002. Nearly all the German universities participated in the competition. After evaluating the proposal, the universities of Augsburg, Münster, Oldenburg and the technical university of Munich were funded with €2.5 million each over a period of five years. A number of (non-funded) universities pursued their proposals to improve their information infrastructure via other third party funds or through their own budget. It was clear that these projects were driven by technical and organisational challenges.

### State of affairs in Germany

For a definition of information management, this article relies on the approach outlined by Voss and Gutschwanger:

Information management means the efficient planning, procuring, processing, distribution and allocation of information as a resource for preparing and facilitating decisions, as well as creating the general conditions for implementing them[2].

The focus of attention depends on the content of the core processes at the institutions concerned. If one regards the universities from the standpoint of information management, one can formulate five basic categories (Schirmbacher, 2005):

- (1) The relationship between data, information and knowledge.
- (2) Creating, storing, making available and archiving information.
- (3) Controlling and securing the information process.
- (4) The strategic, tactical and operative management of information.
- (5) The design of communications process.

The aim must be consciously to flesh out these categories at universities and to develop technical environments and organisational models that can supply information efficiently for activities such as research, teaching, studying and administration.

In principle all measures and projects in information management focus on optimising central service portfolios. At the same time recent examples suggest that cost efficiency and the necessity of improving and increasing services are the basic motivating force. Differences may be identified in the approaches and, above all, in the varying local circumstances that determine the desired changes. There is, however, no such thing as an initial scenario in which one can start “from the beginning”, as it were. In other words, all development projects originate in structures that have existed for

many years, that are frequently encrusted with existing staff or stagnating physical resources, and that need to be transformed or shaken up.

The differences in approach – which all basically have similar goals to improve service – may be characterised as follows: they either focus on advancing technical developments (extending and optimising technical infrastructures) or on organisational developments, which may be related to both the information infrastructure as well as to the university's structural areas (the departments, administration, centres, etc.). On closer examination, however, it is evident that the focal points of the two approaches are related and are rooted in a value-added context that focuses on the prime goal of significantly improving central services. Further technological developments and the resulting services necessitate new forms of work and organisation that are, in turn, the prerequisites for achieving the technical and services-related development objectives. Efficient management is essential to ensure successful co-operation between the actors and areas involved. This could assume the form of the "single management" of a chief information officer (CIO) who is working at either the strategic or the operative level, or both. Elsewhere, this responsibility might be assumed by a committee – a "federated management" – on which participating structural areas and their managements are represented. The question of which management model each location prefers depends on local conditions.

Against this background, the question arises: is it better to incorporate the library into the computer centre or the computer centre into the library? The work and functional areas of both structural areas must be integrated, but not at the expense of the one or the other. The question "is integration the royal road to success or simply a dead-end?" misses the point for the simple reason that the need to integrate services is beyond dispute. Even if this question is only directed at the form of management, it still sidesteps the central service improvement goal and the managerial preconditions essential to achieve it. Under certain circumstances, these two aspects can differ considerably, especially at the local level. As far as results are concerned, however, "single management" and "federated management" are not likely to differ greatly from one another. Differences, where they do exist, are most likely to appear in relation to the decision-making process and its sustained success. Considered alone, neither model is better. Hence, the debate is more symptomatic of the fears arising in connection with inevitable changes than it is conducive to confronting these fears and attaining the desired goal.

Although most of the current projects are based on co-operative management, this does not mean that this approach is more viable[3]. It is more familiar in Germany than the CIO model, and does not represent a radical break with the existing structure. In either case, a team approach is necessary. The "single management approach" of the CIO model is here often associated with an "over-bureaucratized mega-institution", even though this is not necessarily the case and can indeed equally apply to the co-operative model. Both forms require a great degree of flexibility. In fact with a flat hierarchy the "single management approach" can be the more flexible of the two, as a number of examples from outside the academic context demonstrate. One must nevertheless take into consideration the fact that a making clear distinction between the strategic and operational levels can prove essential if processes of change – once initiated – are to be sustained.

Successful management presupposes the creation of a service culture that not only accompanies changes, but also helps to shape our work and communications culture.

This aspect is frequently overlooked in the face of all the organisational and technical challenges – usually to the detriment of the project at hand. In order to overcome the differences in various work and communications cultures, a shared service culture is absolutely necessary.

Generally speaking, a dynamic trend towards information management may be seen at all German universities. In fact, there is no academic institution where such plans and implementation concepts are not being debated. At the same time most people in Germany have little experience with organisations that implement that desired services and service-scenarios.

In this context an overview of the situation in the UK is worthwhile, where the some of the discussion on information management in structural areas started. It was also there that the people launched the first projects in the mid-1980s. A book recently published by Hanson (2005a) contains sixteen practical reports on the experiences of 12 integrated institutions, of which two are no longer integrated and two others consciously decided not to adopt an integrated model.

In the UK, the number of institutions that have converged is relatively high: at almost 50 per cent of English colleges and universities, the libraries, media and computer centres as well as administrative data processing must be considered integrated or converged. In all cases the existing structures and the allocation of the institutions reveal a high degree of differentiation depending on local conditions (Field, 2005). Hence, the progress reports compiled by Hanson cannot be considered representative, even though they are instructive about the different backgrounds, motivations, opportunities and risks associated with the convergence process. In the end, the contributions submitted by the converged institutions agree in their assessment that the CIO model's single-management approach:

- is conducive to a holist strategy;
- encourages an economical employment of resources as well as the implementation of interdisciplinary projects and goals; and
- facilitates the standardisation of central information infrastructures and their service portfolios (Hanson, 2005b).

Also remarkable is the fact that in the US, integration models seem to be rarer. This is all the more surprising as the theoretical concept of the CIO model originates in the US (Hardesty, 2005). Nevertheless, the information commons movement in the US deserves special mention here since it quite clearly pursues a service integration approach and has a very similar goal to information management when it comes to developing services (Beagle, 1999).

### Problems and risks

The majority of German colleges and universities are public institutions with legal structures that do not create conditions conducive to the flexible employment of financial resources and staff. This situation does not adequately support the needed changes. Academic institutions also still have a self-concept that asserts a constitutional right to the “freedom of research and teaching”. Hence researchers and teaching staff are granted freedoms that are not consistent with more rigorous management goals and that foster a long drawn-out decision-making process, which the “committee and consensus principle” prevailing at German colleges and

universities encourages. This applies not only to changes in information infrastructures, but also to other areas, as the difficult introduction of the new bachelors and masters degrees shows (Lütke-Entrup *et al.*, 2003). This is one major difference between publicly funded German universities and their American and British counterparts, which are more “business-minded” in general and have “private institution” aspects.

The reluctance to accept an effective and efficient information infrastructure means that the pressure from rising costs and the need to find savings is transferred to both the central operations and to the administration in a disproportionately high degree. The scepticism towards new types of infrastructure can also lead to underestimating the need for change and for the changes to receive limited support from university management. This governance problem is more serious than the financial resource shortage, since it undermines university-wide decision-making. Here too the Anglo-American universities are ahead of their German counterparts. This lack of efficient governance is also a serious shortcoming in other parts of the German university system.

The self-image of the information staff in areas like libraries and computer centres is largely shaped by an emphasis placed on task-oriented work instead of by processes and workflows. The result is a relatively weak service orientation. The reason lies in the high degree of staff specialisation in narrowly defined areas. At the same time, work in academic departments often represents a response to a need to focus more on the local scholarly needs than on more generalisable solutions and standards. That hinders the flexible deployment of competent staff and poses serious risks. One indication of this is the greater emphasis on subject specialisation in the initial levels of management rather than managerial competence. This can perpetuate local developments and forms of work that neither respond to technological developments nor find acceptance among users. In brief, it can result in a proliferation of “self-made islands” with high scholarly pretensions and advanced technology on the one hand, and with a poor service orientation and little standardisation on the other (Degkwitz, 2005).

These risk factors are largely a product of structures and conditions that have existed in Germany for decades. This is true not only of the information infrastructure but also of other areas in the university and college system (e.g. curriculum reform). A persistent tendency of university administrations to act as public authorities also deserves mention. It is not easy to open up and re-orient organisations whose actors are subject to these kinds of influences, although it is by no means impossible.

Finally it should be noted that American “research universities” have four to five times more staff members in computer and media centres and in libraries than do equivalent German universities. Compared with the situation in the US the financial conditions for recruiting and replacing employees, as well as for investments and maintenance, are very restricted, and the labour conditions are regulated by a large number of legal regulations concerning the working hours, the deployment of labour, educational qualifications and salary levels. Generally German universities are still very regulated by the various state governments. On the other hand academic quality in Germany is comparable to the US. In spite of these problems a reasonable degree of efficiency and effectiveness can be found.

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### Expected developments

The overall development goals include focusing more attention on services and demand, as well as optimising costs and enhancing the efficiency of the university information infrastructure. This also means employing management tools that offer more transparent service portfolios and improve the cost-benefit ratio of the services supplied. In practice, this raises the question of service-related development goals. In other words, what service environments should we be striving for in our short and medium-term demand scenarios?

In the medium term, the following service goals should be pursued (Clark, 2006):

- Steps should be taken to ensure that the information infrastructure support process is tailored to core processes in the areas of research, teaching, studying and administration in order to provide the smoothest possible workflow support on a purely digital basis. Users are neither interested in the organisational problems nor the technical issues: they merely want access to the services they need in order to perform a specific task. The current e-learning and e-science activities of German universities offer successful approaches and initiatives.
- The complex issues of access management must be addressed, including users' rights and roles. We can expect a dramatic increase in the use of mobile access scenarios from a variety of machines. Campus users working with university-installed desktop computers will no longer constitute the primary access scenario (and may even be an exception). In order to meet the anticipated demand, a number of precautionary measures have to be taken to protect identities, privacy and roaming and to provide security. The ongoing implementations of authentication and identity management systems at German universities and the introduction of federated authentication procedures (e.g. Shibboleth) and network roaming offer facilities for mobile access and assure the privacy and security of data.
- Intuitive and easy navigation and discovery options are indispensable to ensure rapid access to the desired information. It is irrelevant whether the information is available temporarily or permanently. The aim is to develop personalised portal applications and federated search engines that satisfy the information and communications requirements of different users and target groups in their various work situations. German universities offer user-friendly tools for the search and retrieval of scholarly information, but personalised portals and distributed searching facilities require interactive components (web 2.0) and further development.

The organisational goals are closely linked to the services outlined above. What kind of service organisation is required? If the focus is on workflow support for research, teaching, study and administration, service allocations to individual institutions is relegated the background. Especially important is the implementation of networked areas that interact directly and that secure the anticipated service demands. Instead of focusing on the older structural areas such as the library, the media and computer centres, and administration data processing, the service function spectrum has now shifted to include interdisciplinary (inter-institutional) tasks: the developing fields of e-learning, e-science and e-government being prime examples.

New areas of responsibility are emerging that extend beyond the core tasks, and the traditional hierarchical organisation structure is giving way to matrix-like structures that have to adapt to changing requirements and new demands. Adaptability and flexibility will be the most important success factors. At the same time, strategic development goals and targets are essential to delineate the overall conditions and development focal points.

Customer relationships will play an increasingly significant role not only in the workflow orientation of the service portfolios, but also in the integration of mobile user scenarios. In a situation in which users feel exposed to an almost bewildering diversity of new offers, customer services and customer loyalty are becoming more and more important. Since it is impossible to present new technologies to an infinite number of user and target groups, communication with customers must be firmly supported by a broad spectrum of consultation and support services, while customer relations and care must be positioned as the values of a service culture. Such things cannot be guaranteed by organisational transparency and technical functionality alone.

Against this service and organisation background, and a parallel trend toward fewer employees with fewer material resources, the question arises: to what extent it will be possible to ensure the operation of systems for basic and routine services with capacities that will one day be available almost exclusively at a local level. In all likelihood, there will be an increasingly pronounced trend toward networked forms of co-operation (resource sharing) that link local centres and that explicitly include out-tasking and out-sourcing options. These developments will be accompanied by the increasing standardisation of basic and routine services and the technical platforms on which they are based. They, in turn, will require standard and widely used tools.

Independent local developments will become transitional solutions only if they provide services within the framework of the central information structure. The situation is different with interdisciplinary and subject-related applications, where development will probably lie in providing technical support for workflow-based processes. At present, such support is primarily available for heterogeneous application environments. As far as a service oriented architecture (SOA) is concerned, the continued use of web standards and XML interfaces will play a key role in the integration of the technical systems.

### Conclusion

It is premature for an accurate assessment of the success and sustainability of the current projects. The results of a three-year phase that focused on elaborating planning concepts and implementing the first measures shows considerable optimisation. At the same time, however, problems and risks have been identified that could still jeopardise future implementation. Clearly the implementation of individual projects has been adapted to the local conditions and circumstances of the universities concerned. We cannot assume there is an "ideal" organisational or structural model.

Ultimately it is less a question of finding the right organisational structures than of optimising services. This does not mean that organisational and structural issues should be ignored, but that they should be continually re-examined to take into account new requirements. The development of e-learning and e-science and the traditional



organisation of research and teaching will need to be networked to create workflow-oriented structures as working virtually increasingly prevails in research, teaching, and long-distance collaboration. Such changes will inevitably affect the management of information and communication, which means that the organisation of university information structures will continue to play an important role (see also the recommendations of the Kommission für Rechenanlagen (2006) and DFG-Positionspapier (2006)).

### Notes

1. See [www.dini.de/fileadmin/docs/thesen.pdf](http://www.dini.de/fileadmin/docs/thesen.pdf) and <http://www.dini.de/ueber-dini/>
2. Gutenschwager, K.; Voss, St.: "Informationsmanagement", Springer Verlag 2001.
3. See the different approaches and examples given in Degkwitz and Schirmbacher (2007) and in the recommendations of the Hochschulrektorenkonferenz (2006).

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