

# The Cultural Scope of Chromatic Spaces - The Building of the ICMC/IKMZ Cottbus

by ANDREAS DEGKWITZ

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## ABSTRACT

The ICMC/IKMZ-Building was designed by the Swiss architects Herzog & de Meuron and finished, after a three year construction phase, in November 2004; it is a 32 meter high reinforced concrete construction covered by a double-shell, glass facade embossed with stylized graffiti. The ground plan of the building has a curved outline resembling a clover leaf which does not explicitly have front and back sides. The amazing external architecture continues internally with a spiral staircase extending from the 1st to the 6th floor, and a striking colour scheme (in vibrant yellow, green, magenta, red, and blue) for parts of the floor covering and walls. In addition a further characteristic of the building is that within the ground plan none of the floor plans are the same. With the exception of the management and business areas (7<sup>th</sup> floor) and the technical and pool areas (1<sup>st</sup> and 2<sup>nd</sup> underground level) there are only a few truly separate areas. This allows a flexible and open concept for the use of the building which consciously allows for many work and communication forms for single users or user groups. The work and reading areas are in coves related to each of the floors, while the open access stacks of the library - floor related - arranged according to subject areas are located in the core of the building.

## THE MISSION OF THE ICMC/IKMZ

Desktop and internet, notebook and wireless methods, e-mail and WAP cell phones (mobile phones) have clearly altered research, teaching and study. Computer-based working has led to new forms for the production, transmission, use, and handling of data and content. In contrast to many prognoses the new (digital) media have not, at least so far, replaced the traditional (printed) forms of media. Rather, the digital and printed information carriers complement one another, as do their strongly interacting dynamic and static contents. The availability and use of data, information and content take place via a variety of working platforms, carrier systems and access channels - integration, convergence and networking are the keywords of this development: modern forms of supplying information and media require integrated services.

With this development the suppliers of information and media in the universities are presented with new tasks. Concretely affected are the infrastructure areas of library, multimedia center, computing center and administrative data processing. For the Information, Communication and Media Center/Informations-, Kommunikations- und Medienzentrum (ICMC/IKMZ) of the [Brandenburg Technical University Cottbus](#) (Germany) the challenges resulting from this development were treated consistently. Integrated services will be developed and constructed stepwise so as to stay abreast of new users and their requirements. This applies to the new building of the ICMC/IKMZ, which is available to researchers, teachers and students of the university and also to residents of the city and the region's work and multimedia environments. This includes digital information and communication media, as well as computer workstations, production tools and networked access points.

New services also require new forms of organization and co-operation. Integrated services, which will be presented as new virtual provision from the new building, require, as a prerequisite, close co-ordination and co-operation between the service supplier and the service provider. With the founding of the ICMC/IKMZ at the beginning of 2004 the library, the multimedia center, the computer center and administrative data processing were brought together under a single management, which covered both the budget and staff responsibilities for the areas mentioned. With this consistent integration model the Cottbus University is one of the few universities in Germany, which has, up until now, decided to follow this path. As other comparable examples in Germany, the integration proposals of the Universities of Oldenburg and Ulm should be mentioned [1].

The development lines of the ICMC/IKMZ are in complete agreement with the recommendations of the German Initiative for Network Information ([DINI](#) - Deutschen Initiative für Netzwerkinformation), the recommendations of the German Research Foundation ([DFG](#) - Deutsche Forschungsgemeinschaft) and the Scientific Advisory Council ([Wissenschaftsrat](#)) [2]. It should be understood that the ICMC/IKMZ is *one* (but not the only) model that guarantees the necessary co-operation between library, media and computer centers and administrative data processing, and thus is also experimental in nature. With the path followed by Cottbus, we are at the start of a process whose complete realization requires a mid- to long-term perspective.

Founded in 1991 the Brandenburg Technical University of Cottbus is the only technical university in the state of Brandenburg. The city of Cottbus is in the south-east of Brandenburg (ca. 120 km from Berlin). The university has around 5,000 students, with about 25% students from foreign countries. The profile of research and teaching covers 4 faculties with 130 professors and 24 curricula (BA/MA). The single faculties are: Faculty 1 - Informatics, Mathematics and Physics; Faculty 2 - Architecture, Civil engineering, Urban development; Faculty 3 - Engineering, Electrical engineering, Economics; Faculty 4 - Environmental engineering, Process engineering.



*Aerial photography of the building [3]*

## **THE BUILDING OF THE ICMC/IKMZ**

The heart of the ICMC/IKMZ is the new building in which the library and the multimedia center are housed; the areas of 'operational data processing' and 'computing center' - also belonging to the IKMZ/ICMC - are not housed in the ICMC/IKMZ but at separate locations on the university campus. The architecturally imposing and, at the same time, functionally oriented building was designed by the Swiss architects Herzog & de Meuron [4] and finished, after a three year construction phase, in November 2004 after a long and sometimes very difficult planning process of 5 - 6 years. As a result of this process the intended exceptionality of the building matches its mission as a space, which provides the different facilities and interdisciplinary services for virtual patterns of modern learning, teaching and research. The architectural feature provoked national and international attention: 6,000 people have visited the building since its opening in 2005. The large number of reviews (articles, books, journals) reflects this tremendous interest as well.

The building, which stands in the eastern part of the BTU site between the University and the city, is a 32 meter high reinforced concrete construction covered by a double-shell, glass facade embossed with stylized graffiti. Costs: €8 million (building), €1,9 million (furniture and equipment), €2 million (site incl. fees). The ground plan of the building has a curved outline resembling a cloverleaf that does not explicitly have a front and rear. The main useable area is 7,630 m<sup>2</sup>: 5,461 m<sup>2</sup> for public use, 976 m<sup>2</sup> for administration, and 1,193 m<sup>2</sup> for the closed stacks. [5] Altogether the

new building has more than 700 workstations available (622 for users, 78 for staff). The user workstations are divided into 490 networked reader stations for notebook use, 61 pool stations, 54 research stations and 17 carrels. These facilities will be enlarged by around 100 workstations (diskless pc-stations) in the beginning of 2005. The amazing external architecture continues internally with a spiral staircase extending from the 1<sup>st</sup> to the 6<sup>th</sup> floor, and a striking color scheme (in vibrant yellow, green, magenta, red and blue) for parts of the floor covering and walls.



*The facade in detail*

In addition, a further characteristic of the building is that within the ground plan none of the floor plans is the same. With the exception of the management and business areas on the 7<sup>th</sup> floor and the technical and pool areas in the two underground levels there are only a few truly separate areas. This allows a flexible and open concept for the use of the building, which consciously allows for many work and communication forms for single users or user groups. How these will combine with each other, practice will show. The work and reading areas are in bays related to each of the floors, while the open access stacks of the library - floor related and arranged according to subject areas - are located in the core of the building.



*The staircase and the reading room of the 2<sup>nd</sup> floor*



*The reading room of the 2<sup>nd</sup> floor*

The library, with its underground stacks and specialized libraries distributed over six floors, is the focal point of the building's use: The individual specialized libraries are distributed over the various floors as follows with open stacks: Special library 1: the Arts, Economics, Law (1<sup>st</sup> underground level and 2<sup>nd</sup> floor); Special library 2: Architecture, Civil Engineering, Technology (3<sup>rd</sup> and 4<sup>th</sup> floor); Special library 3: Natural Sciences, Environment, Informatics/Computer Science (5<sup>th</sup> and 6<sup>th</sup> floor). The multimedia center occupies the 1<sup>st</sup> floor by itself with its facilities for multimedia production as well as for tele-teaching and tele-learning environments. On the ground floor, there is a lending desk, a service counter for all services of the ICMC/IKMZ and an exhibition area. In addition, on their appropriate floors, are the individual helpdesks of the specialized libraries as well as printing, copying and scanning stations. Moreover, in the 1<sup>st</sup> underground level, group and presentation rooms provide various possibilities for multimedia functions. In the 2<sup>nd</sup> underground level those stacks are located, which are closed for the public (Mittler, 2006; Warnatz, 2005).



*The staircase from the 6<sup>th</sup> floor*

An important precondition for the supply structure in the new building is the network based access system. This is a modern, high capacity system based on a complete glass fiber infrastructure from the center to the individual workstations. The active technology used, the 'Motor of the Network', has a maximum transfer rate of 2x70 million data packets per second in routing processes or, in other words, 256 Gbit/s backplane bandwidth. The modular and fail safe chassis has enough space and performance reserves to supply the server for the library and multimedia center and the numerous workstations and research computers. It can activate and supply ca. 920 ports (connections), each with 10/100 Mbit/s, or 420 ports, each with 1Gbit/s. Built upon experience in the area of authentication and authorization in the campus network, a developed logon system, with modern security, is used in the cable-connected, as well as the wireless areas (wireless-LAN) in the ICMC/ IKMZ building for students, members of the university and external visitors.

## **THE BIGGER PICTURE FOR SERVICE**

The integration approach will be carried through on both the technical and organizational levels (**Degkwitz, 2005, 2006**). The technical integration is related particularly to archiving and back-up, homogeneity of the basic data of university staff and students, mail and web services and unification of the use of operating systems and software. In this way - within the limits of what is technically possible and maintainable - redundancies in the hardware and software areas, as well as data storage, will be avoided and, at the same time, a long-lasting standardization of the basic services will be aimed at. The organizational integration will embrace services in which individual activity areas intersect and/or in which at least two activity areas participate such as authentication and authorization services, filing and storage services, as well as production and publication services.

The main objective is to make available to the user and target groups of the ICMC/IKMZ the most homogeneous working environment possible as a 'work-flow based' service. In this connection, the analysis of the core processes in research, teaching and administration as well as the related support processes offered by ICMC/IKMZ are of great importance. In this way the service provision for education and research will be fulfilled more comprehensively and with more efficiency than by the many different initiatives of several service providers. Thereby, a converged institution like the ICMC/IKMZ has to act with a high level of flexibility to provide the benefits expected by the university and the faculties. With the further development of the ICMC/IKMZ there are good opportunities and conditions to establish an efficient e-learning resource center for the university and for the whole region (**Degkwitz, 2005**).



*The lending desk*

However, the integration approach is also given by the building and its spaces, which invite students and researchers to work singly and/or in groups. On the 6<sup>th</sup> floor there are 18 cabins (carrels) for graduate students. The group areas, which are located in the 1<sup>st</sup> underground level and in the multimedia center, are very well equipped to offer computer

based courses and training, as well as multimedia presentation and videoconferencing. Even in the many reading rooms of the different floors users have the possibility to work alone and/or in groups. By providing areas of different sizes, users are able to organize their communication and working needs without special orders or regulations.



*The communication area in the ground floor*

The ground floor is partly used as an area for exhibitions of faculty projects or external partners. The university is very appreciative of the fact that the large reading rooms can also be prepared for conferences and social events. There were fears that, because of the openness and the transparency of the different floors, the building might be too noisy for those wishing to work in concentration and silence. In fact, this is true for the staff area of the multimedia center on the 1<sup>st</sup> floor and for the offices of the subject librarians on the 5<sup>th</sup> and the 6<sup>th</sup> floor, where protection against noise has to be improved, but the readers and users don't seem to be disturbed by the possible influences of noise. On the one hand, it may be that there are places and rooms enough for everyone to find the right environment; on the other hand, it might be a matter of practice and preference.

The activity areas are collected organizationally in the ICMC/IKMZ and are managed jointly. The head of the ICMC/IKMZ, as the chief information officer of the university, has responsibility for the operation and further development of the ICMC/IKMZ, which includes the budget and responsibility for staff; he reports to the president or the presidential council of the university. At the same time, the ICMC/IKMZ management is responsible for keeping for the future development and implementation of the ICM strategy in concert with the overall strategy of the university. The second management level within the ICMC/IKMZ is formed by the heads of the individual departments of the ICMC/IKMZ (library, multimedia center, computing center and department for administrative data processing).



*Working environment 1*

To avoid 'administrative overheads' the operational co-operation of the two management levels is deliberately oriented - in the sense of a common development objective - towards existing projects e.g. applying for third party funds, data processing equipment and networking of the new building, web-presence, helpdesk and service options within the framework of the front office. The technical implementation of these projects is carried out by the corresponding teams whose activity is short or long term depending on the project objective (Degkwitz, 2005).



*Subject library on the 5<sup>th</sup> floor*



*Helpdesk of the 5<sup>th</sup> floor*

Thus, within the framework of the service development of the ICMC/IKMZ, matrix-like organizational structures are used which should guarantee the necessary flexibility for permanently changing user -and service demands.

Since 2006 the following teams have been established, recruited from different departments:

- Team 1: Public relations and budget planning.
- Team 2: Front-Office.
- Team 3: Innovation-Office in cooperation with the project elearn@btu. [6]
- Team 4: Content- and Data management.
- Team 5: Consolidation of systems.

The teams report to the head of the ICMC/IKMZ and to the executive board of the ICMC/IKMZ, which meets regularly and includes the head of the ICMC/IKMZ and the heads of its departments.



*Working environment 2*

An advisory board of the ICMC/IKMZ, still to be appointed, will collect and extend the participation and responsibilities of the formerly active committees and commissions (e. g. library committee). The advisory board will be composed as follows: the responsible vice president as the representative of the presidential council (chair), a representative from each of the (four) faculties, the chancellor as the representative of the administration, a representative for the scientific staff, a student representative. In addition, focus groups will be formed, as theme related working panels, in which representatives of the user and target groups of the ICM-services and ICMC/IKMZ staff will co-operate in solving problems promptly and in improving individual service provision.



*The exhibition area*

## **CONCLUSION**

The charm of the building is the adventure of its shape and its colours. Nobody can be afraid of yellow, green, pink, red and blue - the spectral colours of the floors, the walls and as well the colours of the new media world. There is no 'cultural gap' between this signature of the building and the matters concerned with the work of the users. The building and the concept to provide the service are picked out as a 'place of ideas' in the campaign 'Germany - country of ideas' in conjunction with the soccer world championship 2006. The juxtaposition of 'living' spaces, good technological equipment and integrated services creates a sympathetic atmosphere and a culture of new thinking,

which encourages and inspires everyone who is in touch with it.[7] Is there anything more encouraging than these new features of European culture?



*The building from the south west*

#### *Acknowledgements*

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#### **NOTES**

1. See the integrated institution [IBIT](#) of the Carl von Ossietzky University of Oldenburg and the communication and information center ([KIZ](#)) of the University of Ulm. The learning center approach in the United Kingdom set an example to ICMC/IKMZ (**Hanson, 2005**). A further important influence is the 'Information commons' movement (**Beagle, 1999**).
2. Cf. the position paper of the German Initiative for Network Information ([DINI](#) - Deutsche Initiative für Netzwerkinformation) 1998 and 2001, the recommendations of the German Academic Council ([Wissenschaftsrat](#)) 2001, and the recommendations of the German Research Foundation ([DFG](#) - Deutsche Forschungsgemeinschaft) 2001 and 2002/2003.
3. Many thanks to Ralf Schuster (ICMC/IKMZ) for the photographs. All the rights for the pictures are reserved by the ICMC/IKMZ of the Brandenburg Technical-University of Cottbus.
4. Cf. for the architectural idea (**Herzog & De Meuron, 2002**).
5. About the planning and the process of the construction (**Tanneberger, 2003**). For the air condition and energy concept (**Hänel, 2002**).

6. To enlarge the facilities of e-Learning in the university the project elearn@btu was set up in 2005. The activities of this project are funded by the Federal Ministry for Education and Research in a three year term (2005-2008) with an amount of € million.
7. More detailed information about the building of the ICMC/IKMZ has been provided in response to the questionnaire of the LIBER Architecture Group (Mittler, 2006).

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## WEB SITES REFERRED TO IN THE TEXT

- BTU - Brandenburgische Technische Universität Cottbus. <http://www.tu-cottbus.de/cms/?L=1>
- DFG - Deutsche Forschungsgemeinschaft. <http://www.dfg.de/en/index.html>
- DINI - Deutschen Initiative für Netzwerkinformation. <http://www.dini.de>
- IBIT - Informations-, Bibliotheks- und IT-Dienste. <http://www.ibit.uni-oldenburg.de/>
- KIZ - Kommunikations- und Informationszentrum. <http://kiz.uni-ulm.de/index.eng.html>
- Wissenschaftsrat. <http://www.wissenschaftsrat.de/>