

Project-layout

IT-operation in schools

Construction and securing of media-competence in schools by more efficiency and cost-transparency in the IT-basic supply

Contents

1.0	INTRODUCTION.....	2
2.0	SUMMARY.....	3
3.0	ACTUAL-STATE	4
3.1.	CHARACTERISATION.....	4
3.2.	EVALUATION	5
4.0	SOLUTION-SCENARIO	6
4.1.	VALUE-ADDED CENTRALISATION	6
4.2.	MODULAR SERVICE- AND COST-APPROACH	8
4.3.	SOLUTION-PERIOD.....	9
4.4.	COSTS	9
4.5.	FURTHER PROCEDURE.....	9
4.6.	ATTACHMENT.....	FEHLER! TEXTMARKE NICHT DEFINIERT.



1.0 INTRODUCTION

Facing the central importance for computer- and net-competence in our emerging information-society, educational institutions particularly schools today meet with the challenge to integrate Information- and Communication-Technology as part of a culture of learning and teaching.

Central issues of that culture are media-competence, networked thinking and acting, teamwork, interdisciplinary and lifelong learning.

In this respect a bigger part of present emerging employment-possibilities are to be found in the information- and knowledge-field.

An absent or a lack of qualification in this field may cause a serious restraint of professional prospects and chances of social participation.

In series, it is a matter of the development of learning-ability as equal key qualification next to the intermediation of factual knowledge, social competence and creativity.

While previous and present initiatives of education minister, school institutions and private investors as well as development programmes of N21 have seriously improved the IT- equipment at schools in the past three years, the demand for a professional, sustainable and affordable IT-operation stays open up to now.

The costs for such an IT-operation are quite high compared with the purchase costs of IT-equipment. They are caused predominantly by the essential employment of staff, which arises by installation, maintenance and operation of information-technology.

It is necessary to check in what extent financing models, like sponsoring, development association, public-private-partnerships or even leasing-models reference to its applicability are qualified and on what scale the cooperation between communes, municipals and counties are feasible for using synergies and generating an added value.



2.0 SUMMARY

The realisation and financing of a high quality IT-operation in schools becomes more important everyday.

This document considers the actual state in schools in the institutions of the municipal Osterholz-Scharmbeck and shows after a technical and structural evaluation a potential solution.

The pure installation of a remote maintenance system crosses the problem only at a fraction. All located deficiencies show the necessity of a general and durable solution.

The perception may not be limited on a specific form or size of school.

The central idea is the establishment of a support- and media centre with fix and durable human resources.

Through potential integration of the "rental centre for educational films, Osterholz-Scharmbeck" it is possible, next to realisation of an IT-operation in schools, to expand keenly the supply spectrum in ability to deliver online-media (Audio/Video).

Aim is to minimise the existing, extensive on-site-service in schools by simultaneous raise of service activity, quality, cost-transparency and planning reliability.

Orientated on the offer of big support-provider could get high-quality support-packages (bronze, silver, gold). The service-quality of those packages has a direct impact on pricing of a nevertheless required on-site-service.

The more precious the selected package, the more unnecessary on-site services are becoming and the more favourable those packages can be provided.

A modular approach enables to allocate those services in schools outside of the institutions.

By realisation it must be pointed out, that through application of technology the educational and pedagogic decision-making and responsibility of teaching staff is not being impaired.

On this account it is recommended to involve those duly, in order of considering and generating accurate concepts for using respectively the application of IT at school.

A necessary basis-measure for the further advancement is a reorganisation of the internal school- and administration-networks as well as the installation of a broadband network, which connect schools among each other.

For implementation of this requirement the formulation of a detailed IT-operating concept is recommended.

The implementation should take place project-based with a solution period of five years.



3.0 Actual-State

3.1. Characterisation

From the about 70.000 computer in Lower-Saxony schools about 450 computers including periphery are operated in the 13 schools of Osterholz-Scharmbeck.

The operation of the IT-infrastructure is realised by IT-authorized teachers of the particular school, and also by two erstwhile "ABM-labours.

Those operate the support since March 2006 for at least the end of 2006 as independent IT-service provider.

Excepting from the administration is the sector telephony, which is attended by faculty 10 in the town hall.

Trials to handle the operation of the administration-network (headmaster, office, school assistant) in schools by the faculty 10 failed, because of the absence of willingness of schools to accept the user-arrangement of the faculty and so to put up with associated access-restrictions (e.g. non- or limited user-rights).

In every school the operational procedure for installation and maintenance is regulated differently.

Each carrier, independent on teacher or IT- service provider, acts on the best of one's knowledge. Even the approach and the knowledge of the IT- service supplier among each other are quite different and is orientated on customary standards.

There are no or only sporadic documentation-approaches, which enable an overview about configuration or topology of the respective school- or administration networks. The existing documents are distributed on schools, institutions, facility management or computing- divisions of the county and IT- service provider.

In March an IT-framework-concept was adopted by school and schools institutions, which regularises some minimum-standards like minimum-equipment, purchase, data security- but does not involve operating policies in terms of an IT-operation.

Attendant to the above mentioned IT- framework concept the ISERV Software has been introduced.

This software-platform acts in the first instance as communication-platform for teacher and scholars and can be understood as approach integrating new media in the general school-lessons.

The often associated aspect with the above mentioned platform of remote maintenance does definitely not belong to the functional range or central idea of the software.

For that reason a HelpDesk with the aid of the „Baltic Rural Broadband Project“ and school institutions was implemented (quote wide attachment).

This system shall help to coordinate the upcoming support-sequences.

School institutions and schools as well as IT-service provide have access to that HelpDesk.

An access for further faculties or institutions is possible at any time.

The software is in the frame of the project-runtime in a pilot-phase.



Each school possess over at a minimum one internet-access.
A supply by a free-of charge T@School DSL could not be realised everywhere because of technical reasons or it was not available everywhere.
The installation of programmes occur normally manual on each computer.

By larger schools it is locally acted with an Image-Technology, which enables partly a transfer of installation to other systems.

There is no area-wide service of security-solutions (firewall, antivir-software, [Wächterkarten](#)¹).

3.2. Evaluation

An analysis of the above mentioned actual state shows deficiencies in the following sectors, whereas the following numeration shall not give any conclusions about prioritisation.

1. Operation& Process- description

There is a general lack on defined technical workflows in the areas maintenance, installation, corrective maintenance of hard- and software.

The involved persons are acting to the best of one's knowledge, like they think it is right. Through the very different, widespread Know-How it leads to a very unequal output-quality, what concerns the frictionless operation of the IT-infrastructure?

2. Net-work infrastructure

The existing net-work infrastructure is not available in the same quality in every school. Partly it is not even possible to send emails from the administration-network or to receive. Structured wirings are only present in schools, which has been refurbished and equipped with new IT-infrastructure in the past two years.

In reference to the effective implementation of ISERV, particularly in large schools it leads to failures and access-bottle necks, when scholars and teachers access to the server from home, like it is planned in the using-concept of ISERV.

It originates, that DSL enables a fast data-download, but a data upload (e.g. by an access from home) is only possible at a fraction of the download-speed (asynchronous transmission path).

3. Documentation

There are hardly documentations, which give information about net-work topology, PC-installation, licenses or wirings.

By fault it is to count with an equal, temporal additional work and expenses, before an accurate analysis of failures can be started.

The same applies to planning activities.

4. Inventory- summary & life cycle of a product

¹ As [Wächterkarten](#) are termed hard-ware solutions, which restores a computer to a predefined status after a reboot. So a teacher can reverse all conducted modifications by reboot.

[Wächterkarten](#) are problematically, if computer are supported automatically by updates of security- or antivirus-software, because these updates are deleted through the reboot.



There are no automated or daily-up-to-date summaries about the technical inventory. Inventory-lists have to be written manually in every school. Through this elapsed life cycle of products are probably not realised timely and new acquisitions or replace investments are not planned betimes.

5. Human- resources

Despite of increasing, qualitative demands for the application of new media in schools, there are no sustainable specific resources, which are responsible for a professional, future-proof and demand-suitable realisation of an IT-operation.

As orientation a customary rule of thumb can be determined: "1 administrator per 100 processors".

In the reverse currently these activities for four and a half full time jobs are managed by two IT- service providers with converted about 25 hours per week.

6. High on-site effort

All above mentioned points causes a very high on-site effort. From 50 purchased hours per week for support by external service-providers, about 90% are bonded on-site.

Further troubleshooting-demands by other schools can not be solved at that time.

Arrival and departure have to be regarded as time-critical as well.

A practicable access per remote maintenance is nonexistent presently.

7. Licence-management

There is no established licence-management. The use of pirate-copies on school-computer cannot be excluded and is in all probability.

8. IT-safety

Given that in schools safety-software-products are hardly ever used, a virus-infection can disperse rapidly also outside the schools.

In fact many computers are equipped with [Wächterkarten](#), these do not protect against virus-infection or a further dispersion

Sensitive data on the administration-processor is secured timely.

9. Software installation & Configuration

The installation of software-products, updates and safety-patches, etc... is currently possible only on-site for each computer.

The transmission of installation via Image is only possible on schools with identical hardware.

In that place, where [Wächterkarten](#) are applied, the creation of Images is very time-consuming.

4.0 Solution-scenario

4.1. Value-added centralisation

For guarantee of a regulated IT-operation the implementation of a central support-centre is considered as very reasonable.

An intersection for all IT-relevant aspects (planning, purchasing, maintenance, installation, development) would be realised for a maximum-feasible transparency in reference to decision-making and responsibility, efficiency, quality and planning reliability.

Furthermore this support-centre shall serve as important consulting-instance, adverse to schools and accordingly to teachers, for evaluating the technical feasibility of pedagogic concepts.

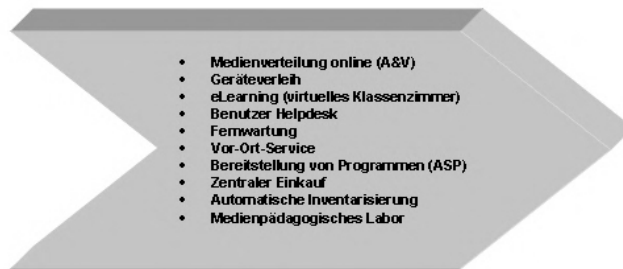


A real added value can result by an integration of the “rental centre for educational films, Osterholz-Scharmbeck” to expand the centre in the sector media.

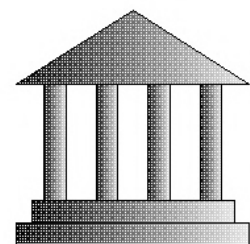
Present resources can long-term induce an intensification of required IT-resources by qualification-measures.

The service-spectrum of such a media- and support-centre can appear as follows:

Medien- & Supportzentrum



Schulen



Media allocation

Online access to film- and audio-material (A&V) by a streaming-server of “rental centre for educational films” added by existing manual lending-offers for film- and audio-media.

Equipment-rental

Equipment, card-material and illustrative material can be reserved online and allocated by “rental centre for educational films”.

eLearning

Scholars and teachers participate in pedagogic contents, which are allocated by broad-band-technology. Experts can give lecture on pointed themes independent on location.
The same technology can be used for cooperation of schools among each other.

Helpdesk & Hotline

Quickly support by technical problems by allocating of a central Hotline-number as well as a web-based HelpDesk.

Remote maintenance

Technical problems can be solved professional per remote-administrator directly.
No loss of time through necessary arrival.
No double personal-binding, because the problem can be solved without attendant teachers or caretaker.

On-site-service

Individual support for complex interferences, hardware-exchanges, or for equipment, which cannot be maintained by remote maintenance.



Allocation of programs

Wide spread programs and services can be allocated by central server in form of terminal-services. Through diminishment of system requirements of school-computer investment costs for new hardware could be reduced by using of so-called Thin-Clients¹. And old equipment could be used longer. The binding of human-resources is going to be reduced, because the individual administration is displaced in aid of a central administration.

Pre-condition for that is the development of a central "server-territory" to reduce the network-impacts and to guarantee an adequate using-rate. For such a model investigation in form of additional hard- and software are necessary (see 4.4 costs) The development of that operation-model can be effected phased in single schools.

Central purchase

The central over-view of IT-operations in school enables an optimal planning of net investments. By an improved package of purchasing-procedures can gained better prices on the market.

Automatic inventory

Via encrypted lines and a direct access to the separate school net-works an analysis of the technical inventory is possible at any time. Thereby an essential exchange of equipment can be recognized and planned duly. The residual values can also be determined.

Media-pedagogic labour

In a trusted area teachers could test on the market available pedagogic software. Licence for test-intentions need not be purchased for several schools. Teachers are participating by a common interchange of ideas. A technical support can occur on site. Several new pedagogic concepts can be validated technically.

Virtual classroom

There is the possibility of offering a vertical class-room for all schools. Respectable personages with practical experience would give lectures on topic themes via video- and audio-transfer. These lectures will be transfer online in real time into schools. Scholars and teachers can act interactively and interchange. Such a model is offered free of charge by a south-German project-team. It could be used, if schools would possess an adequate broadband-connection.

4.2. Modular service- and cost-approach

Basis for a long-term cost-transparency is an explicit calculation of prices for the provided services. Imaginable is a model, like it is practised by leading support-enterprises in the private sector.

¹ The Thin-Client-Konzept denotes, that a client sources its data from one server. That includes particularly the whole operation-system. In a further variant the Thin Client possess simply of a keenly slim operation-system. The client has no data-storage medium ("diskless client") and starts its system either via Flash-card or via network, on which all application are available.



The user (school) chooses between three different versions of support-packages, which are provided with different service-qualities.

All these versions include a graduated contingent of on-site-services as well as graduated response times.

Potential package-versions are may look as follows:

Bronze: allocation, maintenance and operation, only network-access.
Response time 24 h, incl. 2h on-site-service monthly for individual-support

Silver: allocation, maintenance and operation for network-access and server-services (ISERV).
Response time 12 h, incl. 4h on-site-service monthly for individual-support

Gold: allocation, maintenance and operation for network-access, server-services& PC-support.
Response time 6 h, incl. 6h on-site-service monthly for individual-support

Furthermore on-site-services are to be balanced separately

The greatest cost-benefit-aspect is reached, when as many as possible schools decide for the gold-package and the separate on-site-service can be keep to a minimum.

4.3. Solution-period

To come up to the complexity of this theme a step-by-step realisation within five years can be recommended.

4.4. costs

A statement about the costs cannot be made at this time.

These are caused mainly by the required human-resources and by the required net investments for IT-infrastructure like server, software-licences and network-components.

How many human resources are required for the actual IT-operation depends on how many services can be transacted centrally (reduce of on-site-input).

In principle it is assumed that implementation of such a project is worthy of promotion in the sense of ZIEL-1 promotion.

Furthermore alternative or additional financial-models like sponsoring, development associations, Public-Private-Partnerships or even leasing-models should be checked in respect of its practicability.

4.5. Further procedure



For the further procedure the formulation of a detailed IT-operation-concept is recommended under inclusion of the concerned actors.

The implementation of a broadband-based network for connection of schools among each other is indispensable for realisation of a remote maintenance-solution and the frictionless operation of the ISERV-Server.

Moreover such a network builds the basis for the development of an IT-operation.

