

Early Screening for the Wellbeing of Children

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Early Screening for the Wellbeing of Children

1 Objective

Currently, various procedures and processes are implemented at the federal states, all for one goal:

Of early screening for the wellbeing of children, and to support adequate establishments with appropriate funding to accomplish this task as extensive as possible.

This complex procedure includes:

- Compliance control of early childhood screening
- Speech status determination and support for training
- Intelligent procedures to identify possible abnormalities
- Control of escalation processes and the necessary communication between the relevant authorities and institutions
- Documentation of individual measures

Ministry of social affairs Dr. Gerlinde Kuppe from Saxony-Anhalt summarizes this as follows:

“We want to better protect children against neglect and abuse. At the same time we want to clearly raise the equality of educational opportunity for children, with an obligatory speech status determination (since the year before last) of each child, prior to school enrollment. Early childhood education and promotion is a crucial key of equal opportunity”.

A system to support these concerns does not only need the required functionality, but also must correspond with the data protection regulations.

Within the last years iSM developed such a modular solution with the following important combination:

- The monitoring of early childhood screening
- Early speech training

2 Approach to the Solution

Monitoring of early childhood screening

With this part of the program, various determination methods of negligence and process modeling are offered. With a screening ID the general procedure is simplified.

Speech training

This component initializes the function of speech status determination and organization of speech training at preschools or Kindergartens. At Vienna Austria a corresponding solution is already in use, successfully. It implements a data exchange of the student database.

Identity Manager (IdM)

The core of all solutions is a central administration of all direct or indirect involved persons, and a system with the possibility to assign rights, extremely dedicated (particularly by roles) and combined with corresponding authorization processes (→ Identity-Management = IdM).

The IdM offers the possibility for separate structure units like Kindergarten, youth and social welfare offices, to manage their own personnel including authorizations to a certain extent. With this the central administration is greatly reduced and a selective communication and data provisioning between corresponding facilities is possible.

Also the IdM includes an effective authentication server to apply a dual identification procedure for persons with high authorization levels.

Data interface

The main interface of all components consists to the data of the resident registry office. In the case of escalation, clearly specified data can be transferred to downstream facilities.

Security and data protection

A very sophisticated authorization system which does not only include a role model, but in addition to the request and release of authorizations, also enables a comprehensive reporting and ensures besides the following functions, the concerns of data protection and security:

- Every object and attribute is provided with a security classification to control and monitor the allocation of authorizations by an internal control system.
- Control of task related data access (data view) by authorized user.
- After completion of defined processes or certain events (e.g. reaching of a certain child's age) the corresponding data is locked or deleted.
- A report displays who executed what operation and when.
- Prevention of inadmissible right-combinations by separation of duties.

3 Monitoring of Preventive Medical Examination

With the force of relevant laws in each state (configurable) is an early childhood screening for the “UX” examination for all children of the required age group introduced.

The Institut für System-Management developed a software solution to support the process of increasing the participation rates for the mentioned test which is for the wellbeing and protection of children and to identify potential families at risk.

The software solution **UX-Control** will atomize the process to send out invitations to all parents to participate at each examination for their children. Due to the feedback from doctors, the solution can check if the child’s examination has occurred. If there was no response then the responsible health office or a similar institution will be informed.

The examinations to be documented by births in the state or the **UX-Control** solution recordings for each child, demonstrates that this calculative technical support is sensible and efficient. In addition, a possible error rate is largely minimized with a comprehensive documentation and automated process follow-up.

3.1 Differentiation of procedural method

The procedure of the determination of possibly none early childhood screening is for each state variably intended and technically feasible.

1. Parents are generally invited to this screening
2. Only those parents are invited after determination that they have not committed to the child’s examination.

Also the feedback procedure is differentiated

1. Case 1 (all parents are invited). This invitation is used for feedback by the doctors (fax or letter). The examination can be registered at the system by a scanning procedure.
2. If a screening ID has been used, the doctor may use its barcode sticker as feedback.
3. For every doctor who participates, a Web client for logon to report the conducted early childhood screening is provided.

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3.2 Procedure without screening ID

3.2.1 Principal procedure

UX-Control usually starts with the examination U6, since the previous “Well Child” checkups have been conducted by hospitals or responsible pediatricians. **UX-Control** is configured in two steps for the screening of U6 up to U8. This means, invitations to all children or parents and reminder letters, in case of non participation of the exams are sent. The screening U9 is only conducted in one step, which means with no reminder. These settings are configured, but can be specified for each federal state. Further examinations may be applied or current exams deleted. For the process control of the checkups, individual parameters are defined.

At none examination, despite reminder letters, the responsible Public Health Department will be informed. This information initiates a defined process at the **UX-Control** for the employees of this department. They are informed via e-mail. The system monitors by time controlled message forwarding if this case is being processed. The documentation of the procedures is recorded. Corresponding reminder functions secure the completion of each case.

3.2.2 Data provisioning and processing

Due to the relative large number of data (of school age children), an automatic transfer from the registry office is suggested. Either the data will be available from a central location or from each state by their registry office. The data, based on each client is received in a standard XML format, provided by an adequate input service by **UX-Control**. At defined intervals, the changes are either provided or **UX-Control** outlines, independently, the differences of the total data inventory.

For a unique identification of the children, an internal ID is built which stores all processes. A duplicate control may detect double entries or determines the identity at change of client (e.g. different registry office due to address change). The history can be forwarded to another federal state.

The public health departments are also managed with **UX-Control**.



The screenshot displays the UX-Control interface. On the left, a tree view under 'Location' shows a hierarchy: Germany (expanded) -> Mecklenburg-Western Pomerania, Rhineland-Palatinate, Bavaria, Brandenburg (expanded) -> Barnim Kreis (expanded) -> Consumer Protection and Public Health Office (selected). Other locations include Cottbus, Frankfurt on the Oder, Potsdam, Austria, and Slovakia.

On the right, the 'Object description' panel shows 'Consumer Protection and Public Health Office'. Below it, the 'Object status' panel shows a green checkmark and 'available'. The 'Location configuration' panel is active, showing 'Branch office' configuration with the following fields:

Zip Code	City
16225	Eberswalde
Telephone No.	Fax No.
033 34/ 214 -16	033 34/ 214 -26

Assignment of children to the Public Health Department

In the case of escalation, the Public Health Department will be informed by **UX-Control** of all children assigned there. This should be possible on the basis of the key town of residence of the child, also assigned to this department.

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3.2.3 Documentation of the doctor visit

The documentation process of scheduled doctor visits, differ:

Automatically generating of invitation letters

This procedure is at the start of the system prioritized, since it combines a high degree of reliability with a high automation level. The invitation letters are generated by **UX-Control** with an internal ID. The date and the number of the medical practitioner are recorded at the doctor's office. The form is send to the Public Health Department via fax or postal mail. The information is then assigned and saved to each child's data.

Online documentation

At the **UX-Control** online portal the user (the doctor or by him authorized personnel) is authenticated and finds the child by an effective search mask. Either by the ID number, indicated at the letter, or by the child's name, date of birth and possible place of birth. The user enters the date of the examination and the number of the medical practitioner. Therewith the process is completed. This procedure is technically most convenient and is aspired as the target option.

Prescription form

In this variance the doctor prepares a prescription form with the required information. These forms are collected and sent to the Public Health Department. They are received by text recognition. With this procedure a 100 % secure authentication of the child is not guaranteed, since the prescription form does not contain the ID of the child of **UX-Control**.

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3.3 Process models

3.3.1 Invitation and reminder processes

A service of **UX-Control** takes over the age monitoring of all children and releases the examination processes. If the configured age for the medical exam of the child is reached, a message is placed to the **UX-Control** message room which will release each invitation or reminder process. These processes are internally controlled and monitored.

Valid for all processes:

- If the child moves to another federal state, the process will be completed and the information of the new location is stored.
- Only at target dates, processes are released. If a child has moved to a federal state after the target date, no process will be executed.

3.3.2 Escalation processes

If an escalation process was triggered at the public health department, its progress (actions, results, valuations) may also be documented at **UX-Control**.

No. ↑↓	Status ↑↓	Type ↑↓	Contact person ↑↓	Date ↑↓	Editor ↑↓	Content ↑↓
6920	Contact	by phone	John Doe	01-11-2008	Kindermann, Stefan	Release Escalation process Step 1

3.3.3 Reporting und analysis

Various reports of all actions and status of the child may be generated. Via a timer, automatically pre-defined reports and analyses are generated and sent to specific recipients by mail. Specified by state, reports are available for freely defineable queries.

3.4 Procedure by screening ID

On the basis of iSM for the state of Brandenburg created (**UX-Control**) solution, a customized version, using the screening ID is available.

The following goals are to be reached:

- Guidelines of the law are to be considered
- Proven methods of the screening ID is to be integrated for an easy identification of the children.
- The system provides the unique management and identification of "border crosser"

3.4.1 Concept of functions

Because some states already use the screening ID for other examinations, every child receives a booklet with stickers of the screening ID's barcode. The screening ID is the basis of identification at **UX-Control**. Only parents, who missed the UX exam of their child, will receive a reminder letter.

3.4.2 Screening ID match with reporting data


At screening ID handout also the address data of the parents are recorded. At the central resident registry, a permanent (daily) update of the children's data is executed by **UX-Control**. The screening ID is determined by the address data (name of the child, name of the parents and address) and added to the data records. Clearing cases (if there is not a unique assignment) are processed manually.

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3.4.3 Determination of neglect

After a child has been at the UX examination, the doctor will place the barcode sticker at the form for the report.

Reporting form (draft):

Screening ID  040001323456	Date of exam <table border="1"> <tr> <td>1</td><td>5</td><td>0</td><td>1</td><td>0</td><td>8</td> </tr> </table> Date of birth <table border="1"> <tr> <td>0</td><td>9</td><td>1</td><td>2</td><td>0</td><td>7</td> </tr> </table>	1	5	0	1	0	8	0	9	1	2	0	7	Examination <table border="1"> <tr> <td>U4</td><td>U5</td><td>U6</td><td>U7</td><td>U8</td><td>U9</td> </tr> <tr> <td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> </table>	U4	U5	U6	U7	U8	U9	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	5	0	1	0	8																					
0	9	1	2	0	7																					
U4	U5	U6	U7	U8	U9																					
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																					

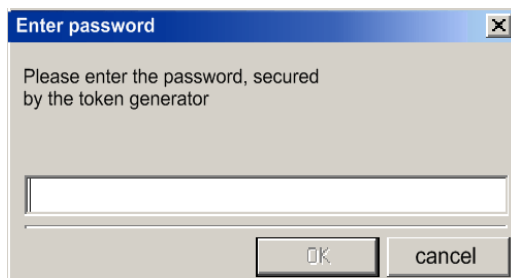
This form (usually DIN-A 4 format) containing several reports, will be sent to the monitoring place and automatically stored to the database.

If executed by fax, an automatically data transfer may not be without errors.

The receipt of the screening ID confirms the early childhood screening.

Alternatively an Online reporting procedure is offered to the doctors. By a secure authentication (via secu token) to the UX Web, the doctor, or by him authorized personnel may enter the screening ID with the adequate information of the UX exam.

The secu token is integrated in a memory stick and is after entry of a PIN generated and clearly matched with the user.



This procedure may be used if the child did not bring its booklet with the screening ID stickers to the examination or if the child has never received a screening ID.

3.4.4 Special cases

1. The child attends the exam and does not have its booklet with the screening ID. Either the parents will bring the booklet later or the online registration will be conducted.

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2. The child attends the exam, does not have a screening ID due to change of location and new to the area. The child will receive a form with screening ID stickers, including an explanation letter for the parents. The screening ID will be entered to the child's data record.
3. If the registration data has been updated and case 2 is noted at the matching process and the parents have already received a form with the screening ID stickers.
4. The child has moved from a different federal state where a screening ID is in use and not yet entered at **UX-Control**. This is noted due to the delivered prior address information of the resident registry office. This may be determined at the clearing process. The screening ID reported by the doctor will be allocated at the clearing process to an open set of the report data. If there is an overlapping of the date with case 2, then the prior screening ID is still valid and the newly sent form with the new screening ID stickers is to be destroyed by the parents or sent back.
5. A child is registered at a certain state, but had the examination conducted outside of this federal state. In this case the doctor does not have a report form. The parents will receive a reminder letter and need to explain this situation. This case might also be clarified by a query of the central screening ID server.

3.4.5 Reminder letter

If at the predetermined time interval no report of the UX exam has been made, a reminder letter will be created and sent.

3.4.6 Escalation procedure

Even if after a reminder letter no exam has been conducted, the personnel of the monitoring place will schedule a house call. This is to be documented at the previous management of **UX-Control**.

In case the house call was unsuccessful due to:

- Parents cannot be reached
- No valid living address
- No early childhood screening

then this case will be forwarded to the youth welfare office. All procedures up to this date are to be documented.

3.5 Document management

The integrated document server allows, to save individual documentation of the child, e.g. individual letters to the parents, scanned letters of external sender (of parents, doctors etc.).

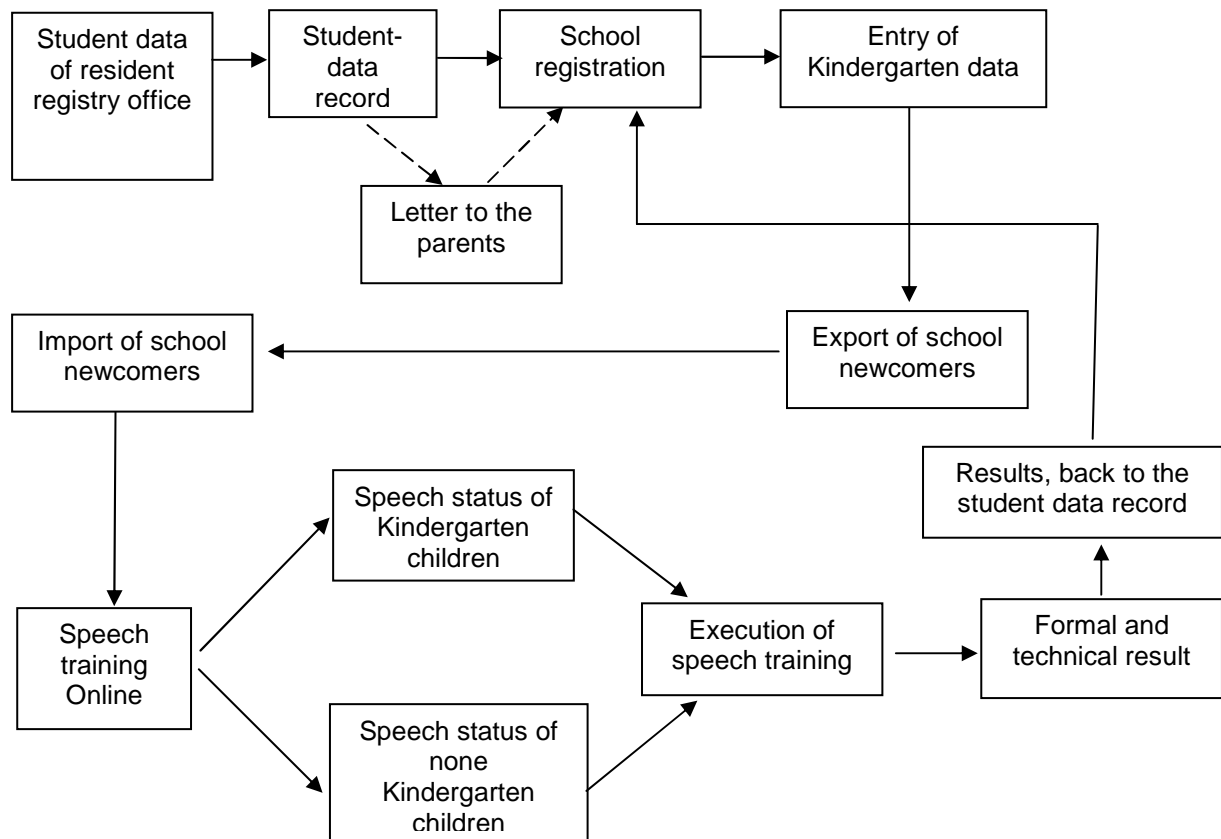
4 Early Speech Training

The speech status determination is executed already one year prior to school enrollment. Therefore is this process separately processed and not bound to the school registration. The previous solution based on the student database is as a starting solution very well suited.

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4.1 Concept of functions

The prior procedure of the student data transfer from the resident registry office to the student database remains, but is preferred scheduled. The parents of all children are notified by letter that their current preschool or Kindergarten has not yet determined the speech status.



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4.1.1 Architecture of the solution

The above demonstrated description of the system is based on the performance in Vienna and the possibly included specifics.

4.1.2 Data transfer

At school registration the data of preschool or Kindergarten is entered. This data is recorded with the child's data (who visited a Kindergarten) at the online speech training system. The data is transferred via secure Web service. Each data record is encrypted at the transfer and also the data which is sent by the Web service (contents of SOAP).

Based on this procedure, will not at any time and in no way, personal data be saved (e.g. as ASCII) or transferred as plain text.

4.1.3 Data structure

To import the data from the student database, the following is provided:

- Student number
- Last name
- First name
- Middle initial
- Date of birth
- Address - Street (House No., Apartment No. etc...)
- Zip code
- Nationality
- Gender
- Language - Native language
- Legal guardian or parent - Salutation (Mr./Ms)
- Legal guardian or parent – Last name
- Legal guardian or parent – First name
- Legal guardian or parent – Street
- Legal guardian or parent – Zip Code
- Consent for the use of the data available Yes/No
- Attends preschool or Kindergarten Yes/No
- Since when in Kindergarten (at this time a text field)
- **Object ID of Kindergarten** (references the Kindergarten data)
- *After school program Yes/No*

In both systems the data of the Kindergarten are synchronous managed, so it is sufficient to transfer the object ID of the Kindergarten.

- *Kindergarten – Name*
- *Kindergarten – Address*
- *Sponsor (bearer) of the Kindergarten - Name*
- *Sponsor (bearer) of the Kindergarten - Address (only for internal use)*

Changes in the mask display may occur to reach the necessary ergonomics for the kindergartens accordingly.

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4.1.4 Determination of speech status

Based on this data, the speech status is determined online, via Web client at the Kindergarten by authorized personnel. Kindergartens with no internet access or computer, an alternative solution, organizationally or technically, will be determined.

4.1.5 Rights and roles

Assuming, every Kindergarten may use the internet function, is to each public Kindergarten a user defined at the speech training-online. This user will function as the admin of the particular Kindergarten. At private Kindergartens, one admin will be assigned for approx. 10 Kindergartens (one bearer). With the allocation to the Kindergarten as the Manager, he will automatically receive a role, including specified rights. Also, he will be able to assign and manage additional user to his organizational unit (Kindergarten). They will in return receive a role, which will authorize them to manage, at the speech training-online, the speech status data and results data of each student.

These are roles of the first rough grouping:

- Profile 1 – approx. 400 user
 - Children at own Kindergarten building
 - Data entry: received points, training needed yes/no, evaluation, two time fields (Start – End ...), text field for comments
- Profile 2 – approx. 40 user
 - Service locations, Organizers etc.
 - All children
 - Data process: all besides ID number, text field for comments
- Profile 3 – approx. 2 – 3 user
 - Administrator rights
 - Create or delete Kindergartens
 - Authorizations: Assigning or deleting user

(Details need to be clarified at project meetings)

4.1.6 Assignment of children to speech status evaluation

Implicit the system contains three groups of children:

- Children at public Kindergartens
- Children at private Kindergartens
- Not at any Kindergarten

The allocation to the speech Kindergarten is as follows:

1. Children attending a Kindergarten, remain at this Kindergarten
2. Children not attending any Kindergarten will be assigned to one and the parents will be notified by letter.

If the child, not attending any Kindergarten is notified for speech status evaluation, then this will be documented at the database.

Exceptions:

1. Children invited to the speech status evaluation and do not attend, are mentioned at the revalidations process at the Task Manger. For all those children a timeout (date of schedule for evaluation) is defined.
2. A listing of actions to this matter may be generated.

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- Children wanting or should attend another Kindergarten as assigned, are imported back to the pool and re-assigned.

4.1.7 Assigning children to the speech training

After speech status evaluation, the parents of children needing speech training, are by letter notified. The assignment is conducted analog just as the previous procedure, but with another status.

To control the processes, the status "speech training" is set and the following status is assigned:

Speech training	Explanation
1	Invited to speech status evaluation
2	Assigned to speech status evaluation
3	No need for speech training
4	Needing speech training
5	Assigned to a Kindergarten for speech training
6	Parents notified
7	Attends speech training
8	Canceled speech training
9	Speech training formally completed

4.1.8 Changing service and late registration

Changes to the resident registry file at the student database are processed (at certain schedules) on a regular basis. Pertaining children of speech training, changes are processed via Web service at the speech training-online system. Examples:

No	Case	Description of the action
1	Student relocates	System status is set to "left", no further impact
2	New student	Import to the system "speech training-online" / late registration
3	Data change 1	Changed data (e.g. address) applied, no further impact
4	Data change 2	Changed data (e.g. address) applied, possibly switch to a new Kindergarten due to relocation

At late registration a separate speech status evaluation is conducted at Kindergartens. This may result to the following:

- Assignment to the speech training with the goal to complete it on schedule.
- Assignment to the speech training with the option to be re-assigned towards the end of the training.
- At exceptional cases a spot for re-assignment to the next training may be reserved, shortly before the current speech training ends.

Everything possible should be done to prepare the children for school enrollment without having to keep them one year behind, due to late speech training registrations.

4.2 Data view

The data of the student database are selectively displayed at the 1st step. The data to be indicated or possible changing of rights are predefined at a project meeting.

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At the 2nd step the results of the speech status evaluation are recorded:

- Number of points 1,
- Number of points 2,
- Need training yes / no
- Text field for comments and notes

At the 3rd step the history of the speech training is documented. The entries occur quarterly.

- Possibly missed days
- Classification of the current results is divided in three categories (good, satisfactory, not satisfactory)
- Verbal assessment of progress

And at the 4th step the end result is documented:

- Missed days
- Classification of the result in three categories (good, satisfactory, not satisfactory)
- Text field for comments and notes

This data is available for the school principal (at the student database) to determine school maturity of the child.

The predefinition of the GUI (data to be displayed, data types and possibly changing of rights) occurs at the project meeting.

4.3 Selections, analysis, listings

Diverse selections are possible at the Web client:

- General search of a child within the Kindergarten
- Listings of all children needing speech training at a Kindergarten
- Selection of Kindergarten type (public, private, not attending Kindergarten)
- Selection of critical cases at current speech training (results so far: not satisfactory)
- Statistics (predefined at project meeting)

4.4 Print data availability

Data to be printed is available by the program in form of an .XLS-table.

4.5 Escalation processes

Children not attending a Kindergarten are assigned to one, to conduct the speech training. If this request is not met by the parents without explanation, an escalation occurs. The following may be supported by the system:

- Creation of a log file with post processing
- Info for the personnel at the Kindergarten by mail or Web client at the Task Manager