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Personalized intelligent platform enabling interaction with digital services to individuals with profound and multiple learning disabilities

ELECTRONIC COMMUNICATION PASSPORT

Deliverable D1.2

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EXECUTIVE SUMMARY

This document provides the proposal of the INSENSION project to create the Electronic Communication Passport (ECP) tool to structure information concerning communication capabilities of individuals with PMLD and related phenomena in electronic form. The ECP is based in the known tools used to assess the capacities of people with severe disabilities. The assumptions of these tools were transformed into the structured electronic documents capable of storing the relevant data. The document format is proposed as human- and machine-readable, thus allowing human professionals to relevantly easy read the data if need be on the one hand and for various computer applications to share the data stored with ECPs on the other. The ECP for an individual with PMLD is proposed as a set of JSON documents collecting information gathered during assessment of that individual performed over time and by a variety of evaluators. The repository of ECPs (i.e. JSON documents storing the ECP information) is at the same time proposed as a RESTful web service, thus enabling construction of applications that can utilize the concept of ECP. Such example applications are the Global PMLD Atlas created within WP5 and the Pedagogical Passport App, which is a potential application that we believe could be useful within pedagogical scenarios.

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1 INTRODUCTION

As part of the undertaken research and development the INSENSION project aims at designing a method that allows to link behaviours to personal intentions of people with profound and multiple learning disabilities (PMLD) and sample them into an Electronic Communication Passport (ECP). This passport is defined as a structured record of relevant information on an individual with PMLD, collected over time. It can be used by people (e.g. relatives, professional caregivers) on the one hand and ICT modules on the other. This means the tool capable of storing and sharing ECPs should enable to link relevant information with coherent personalized record. The ECP helps analysing the state of the person and may, furthermore, a starting point for detecting basic behaviour signals of a person with PMLD. The method of using the ECP within a complex system of care and living environment and the ICT platform developed within the INSENSION project will be validated with the participation of real end-users of various ages who use various behaviours to signal their intentions.

2 DESCRIPTION OF THE ELECTRONIC COMMUNICATION PASSPORT

When aiming to design the ECP, one should attempt at comparing this to the existing and practically used solutions, such as the Personal Communication Passport. The original Personal Communication Passport aims at supporting people with PMLD by collecting important information on them and making this information accessible to others with whom they may want to interact (Millar 1997; Millar & Aitken 2003). This Personal Communication Passport does not attempt to incorporate all available information on a person. It provides an efficient way of sorting and presenting important facts about the person in an accessible manner by giving a short overview of the specific individual in terms of needs, likes, dislikes and behavioural issues. Hence, it prevents a communication breakdown between persons with intellectual disabilities and their caregivers (Sajith 2018).

The ECP of the INSENSION project goes beyond the initial idea of this kind of passport. It incorporates not only little basic information but provides a holistic representation of a specific person with PMLD. The tool is based on a comprehensive paper-based assessment system which was developed previously in the INSENSION project (see INSENSION project deliverable D.1.1). This assessment system includes the main characteristics of a person, concerning general data (personal data, general competencies, additional information on (dis)likes, routines, etc.), and specific data on both communication and inner states (preverbal communication, mood, pain, (dis)pleasure and challenging behaviour), which should be identified by recognizing individual vocalizations, facial expressions, gestures and physiological data. As we discuss this in deliverable D1.1 mentioned above, this assessment system is based in the known assessment tools such as follows:

- Orientation towards Hall, Arron, Sloneem, and Oliver (2008) and Vos et al. (2012) concerning the collection of information on personal data, general competencies, additional Information;
- The Communication Matrix by Rowland and Fried-Oken (2010)is proposed for collecting information on communication;
- The Mood, Interest and Pleasure Questionnaire (MIPQ) by Ross and Oliver (2003) is proposed for collecting information on mood;The Non-communicating Children's Pain Checklist – Revised (NCCPC-R) by Breau, McGrath, Camfield, and Finley (2002) and Non-communicating Adult Pain Scale (NCAPS) by Lotan, Moe-Nilssen, Ljunggren, and Strand (2009) are proposed for collecting information on pain;
- Disability Distress Assessment Tool (DisDat) by Regnard et al. (2007) is proposed for collecting information on pleasure and displeasure or distress.

The data collected with the use of this assessment system are then entered into structured records (or documents) that can be easily shared across the computer networks, between applications and humans. We discuss that proposed structure of these records in Section 3 below.

The ECP can be utilized within a variety of application scenarios. This ranges from assistive or pedagogical scenarios while providing direct care or education to the target end-users through to creation of repositories that aim at gathering knowledge on populations of people with PMLD for research purposes. We also believe that the information collected in an individual's ECP might become the starting point of INSENSION platform usage by that individual. In other word, we foresee that ECP might enable to automatically prepare the configuration of the INSENSION system for use by a given end-user within everyday care scenarios (including daily life assistance and pedagogical activities aimed at increasing skills and potential of that person). This way, the later INSENSION platform shall be able to directly contact caregivers as soon as a special need is detected, which has to be considered immediately. For example, the INSENSION system detects a facial expression which shows discomfort and a high heart-rate combined with the information that the person did not change the position for a long time. This is communicated to the INSENSION system that recommends to caregiver to change the position of the person with PMLD, based on information derived from this person's ECP.

The project will be investigating this possibility in the work performed in other workpackage. It is important to note here that ECP stands for a way to share and exchange information between various applications listed above.

The concept of the ECP and its utilization is presented schematically in Figure 2.1 ECP for each individual shall contain multiple assessments performed by potentially multiple evaluators (such as for example professional caregivers, parents, researchers) in various moments of life of the given individual. This way ECP becomes not only the container of the current consensus knowledge on that individual, but also of the history of changes in communication skills of this individual.

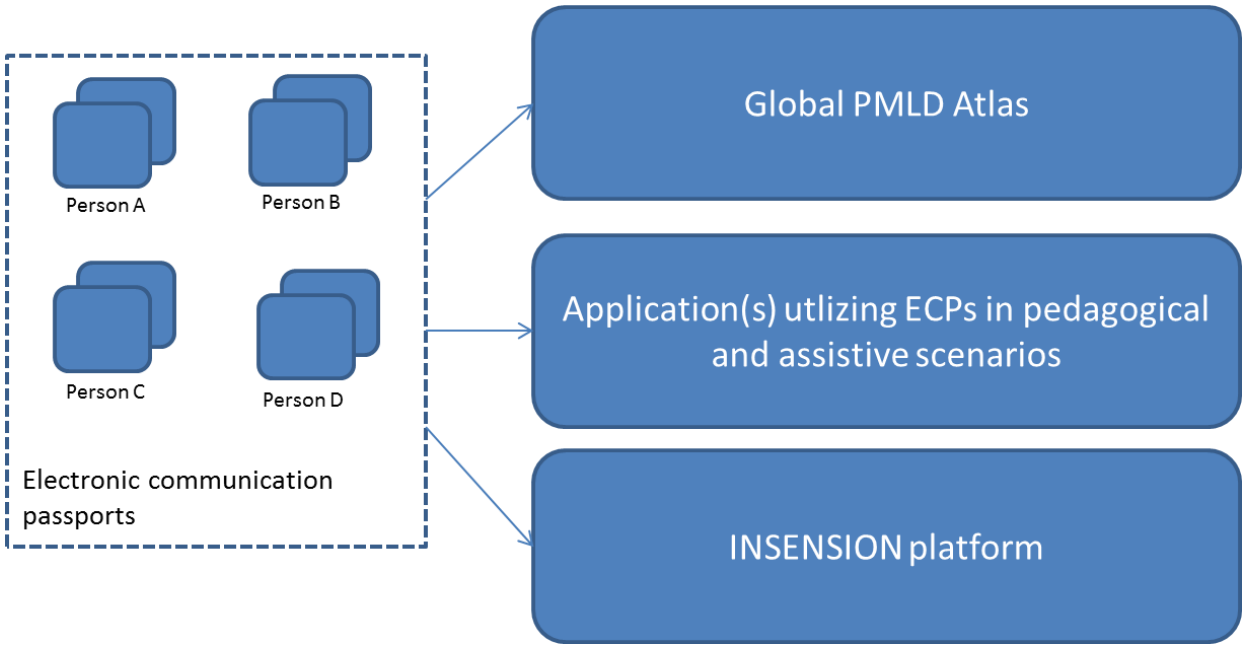

Figure 2.1. Concept of the Electronic Communication Passport and its usage by a variety of applications

3 TECHNICAL FOUNDATION

3.1 DATA FORMAT

The data used to describe a person with PMLD and their characteristics related to communication and relevant phenomena concerning their behaviours, are collected through a specifically defined questionnaire. This questionnaire is built on top of existing and known assessment tools, as mentioned in Section 2 above. Since the ECP is to act as a tool that enables to share the information on the particular individual with PMLD between people, applications and service, a format for exchanging these data in electronic form must be proposed.

For this purpose, one should look into the existing standards for data exchange in digital form. In addition, it may be very usable to use a standard that is readable not only by machines, but also by humans. Below we shortly review some of such standards.

One of the most popular standards used for creating data exchange protocols has recently been XML – Extensible Markup Language (Harold 1996). XML has gained vast popularity for exchanging data within the World Wide Web. It defines a set of rules for encoding structured documents. While documents were the primary target of the standard usage, the ease of creating new XML data exchange formats by humans had influence on its widespread use also in other scenarios, such as exchanging structured data within web services. XML is used as the primary choice for messaging in many computer systems designed in accordance with SOA - the Service Oriented Architecture (Newcomer & Lomow 2005).

A language targeting some of the similar applications that are targeted by XML is YAML - YAML Ain't Markup Language (Ben-Kiki, Evans & döt Net 2009). It proposes a minimal syntax that enables to create minimal size human-readable messages, easily used in network applications or for configuration files. Unlike XML, YAML is line-oriented, therefore it is easier to create parsers of messages written using YAML. A subset of YAML 1.2 is JSON – JavaScript Object Notation (Bray 2017). JSON is used to transmit data objects containing attribute-value pairs and array data. It is ever more often used for asynchronous client-server communication, including browser-server. This makes it easily usable within systems designed in accordance with the RESTful paradigm (Richardson & Ruby, 2007). One of important features is also JSON's natural link to JavaScript scripting language and therefore its natural ease of application into such technologies as Ajax which enable to create robust rich web applications.

Other human-readable formats for exchanging digital data include REBOL and Gellish. REBOL – Relative Expression Based Object Language is known for its facilitation of creating small, optimized, domain-specific languages for coding and data exchange (Goldman & Blanton 2000). It has been used in a variety of applications, ranging from Internet-based applications, database applications through to multimedia applications. Gellfish, on the other hand, is based in the concept of a formal natural language (Van Ranssen 2005). It allows to create a number of natural language variants. All expressions in Gellfish are represented as unique identifiers, therefore it is easy to translate them from one natural language to the other. Gellfish started as the "Generic Engineering Language" and has since been applied to a variety of other domains.

Taking into account the fact that one of the primary scenarios of using the ECP data is within a number of user-side applications, such as those discussed below in Section 4, we assumed to use JSON as the standard for ECP data formatting and exchange.

It is proposed that an individual ECP JSON document shall represent results of an assessment of a person with PMLD performed on a given day by a given person. It shall therefore contain the following objects:

- "Person"

- "MedicalCharacteristics"
- "Communication"
- "AberrantBehaviour"
- "MoodInterestPleasure"
- "NCPain"
- "PleasureAndDispleasure"

These objects relate to the specific parts of the assessment survey as described above in Section 2. The object "Person" contains basic information related to the individual to whom the given ECP record relates. Due to the fact that the ECP data are to be shared across a range of applications, the ECP records do not contain any information directly identifying the person whom they concern. The records are pseudonymized, i.e. the individuals are hidden behind randomly selected identifiers. Connection between the identifier and the actual person are (should) be known only to those people who have direct, physical contact with that person (or a digital application having such direct contact with that person).

The JSON data format for the ECP data exchange, through an example ECP record, is included in Appendix A to this report.

3.2 TECHNICAL IMPLEMENTATION

Practical technical implementation of the Electronic Communication Platform defined as discussed within the current report, requires delivery of two major modules. These modules include the data repository enabling the storage of the ECP data and the access interface allowing to upload and to download the data from the repository.

The data repository has been designed as a non-relational database created within the MongoDB database system (Banker 2011). MongoDB is a document-oriented database platform capable of storing data within JSON-like documents. The system provides functionality enabling to read the data using ad hoc query, create indices and aggregate the data. It can run across several servers, thus enabling replication of the data and provide load balancing. Due to the fact that JSON has been selected as the format for data storage and exchange within the ECP tool, it does not require any additional operations such as design of the database schema known from the relational databases.

The access interface to the repository of the data has been designed as a REST API. Apart from enabling the management of the ECP data, the API features also methods related to the management of individuals with PMLD for whom ECPs are stored within the ECP data repository and to the management of the users of the data repository. Access to the data is only possible for defined users.

The methods related to the management of the ECP data include as follows:

- *GET ecp.insension.eu/api/survey/{surveyid}* – allowing to download data relating to a specific assessment (saved in the repository with the unique identifier *surveyid*);
- *POST/PUT ecp.insension.eu/api/survey/* - allowing to store data relating to a new assessment;
- *POST/PUT ecp.insension.eu/api/survey/{surveyid}* – allowing to modify the data relating to a specific assessment (saved in the repository with the unique identifier *surveyid*);
- *DELETE ecp.insension.eu/api/survey/{surveyid}* – allowing to delete the data relating to a specific assessment (saved in the repository with the unique identifier *surveyid*).

The methods related to the management of individuals with PMLD for whom the data is stored within the ECP data repository are as follows:

- *GET ecp.insension.eu/api/people* – allowing to download a list of unique identifiers of individuals for whom the data was entered by a given repository user
- *GET ecp.insension.eu/api/people/{personid}* – allowing to download the ECP data related to the individual with the unique identifier *personid*;
- *POST/PUT ecp.insension.eu/api/people/* - allowing to add a new individual to the population of persons with PMLD for whom the repository stores ECP data;
- *POST/PUT ecp.insension.eu/api/people/{personid}* – allowing to modify the data of the given individual with PMLD (individual with the unique identifier *personid*);
- *DELETE ecp.insension.eu/api/people/{userid}* – allowing to delete the data of the given individual with PMLD from the ECP data repository.

It must be noted here that the data for the given individual with PMLD that are stored within the ECP data repository include only the year of birth and the unique identifier of the user who entered the ECP data of the given individual with PMLD into the repository.

The methods related to the management of the users of the ECP data repository (i.e. the user who can enter the actual ECP data resulting from the assessment of individuals with MPLD) are as follows:

- *GET ecp.insension.eu/api/users* – allowing to download a list of all users of the ECP data repository;
- *POST/PUT ecp.insension.eu/api/users* – allowing to create a new user of the ECP data repository;
- *POST/PUT ecp.insension.eu/api/users/{userid}* – allowing to modify the data of the given user of the ECP data repository (identified with the unique identifier *userid*);
- *DELETE ecp.insension.eu/api/users{userid}* – allowing to delete a given user of the ECP data repository ((dentified with the unique identifier *userid*).

4 APPLICATIONS OF ELECTRONIC COMMUNICATION PASSPORT

In the previous sections the ECP has been defined as a tool to store and enable data collected through a complex assessment of individuals with PMLD. While the JSON format used to store the data is highly human-readable, relevant specialized applications capable of consuming the ECP data should be created. In this section we discuss two such applications: The Global PMLD Atlas that is launched by the INSENSION project as means to collect knowledge on the global population of people with PMLD, and the Pedagogical Passport App, which is a potential application to develop on top of the ECP. The actual relevance of the latter shall be verified within a series of focus workshops organized by the INSENSION project to identify assistive applications that can be created for use by individuals with PMLD with the direct support of the INSENSION platform.

4.1 GLOBAL PMLD ATLAS

The Global PMLD Atlas is thought as a knowledge repository available to the community concerned with supporting individuals with PMLD and/or with studying these particular types of disability. This knowledge repository is created in response to neglecting of population with people with PMLD from intensive research until today. Therefore, the Global PMLD Atlas provides a user interface to a repository which contains a comprehensive collection of information on the target group. Registered researchers can add pseudonymized data from people with PMLD using an online data form. In exchange, they get access to the whole of the collected database for their own research studies. Within this process the database as well as

the assessment system will be permanently enriched and optimized. It is expected that the research community shall be engaged into the discussion on the scope and function of the Atlas.

In the first version of the Global PMLD Atlas application the following functionality has been enabled:

- the management of a pool of individuals with PMLD related to a given researcher (i.e. individuals for whom the given researcher provided/aims to provide data to the Atlas);
- entering assessment data with the use of the survey tools – due to the fact that the whole of the assessment survey is lengthy, the function allows to save a draft (i.e. not complete) record;
- and browsing the data.

The Atlas has also been equipped with the multilinguality capabilities.

Figures below present some of the screens of the Global PMLD Atlas (shown are screens before the official launch of the service).

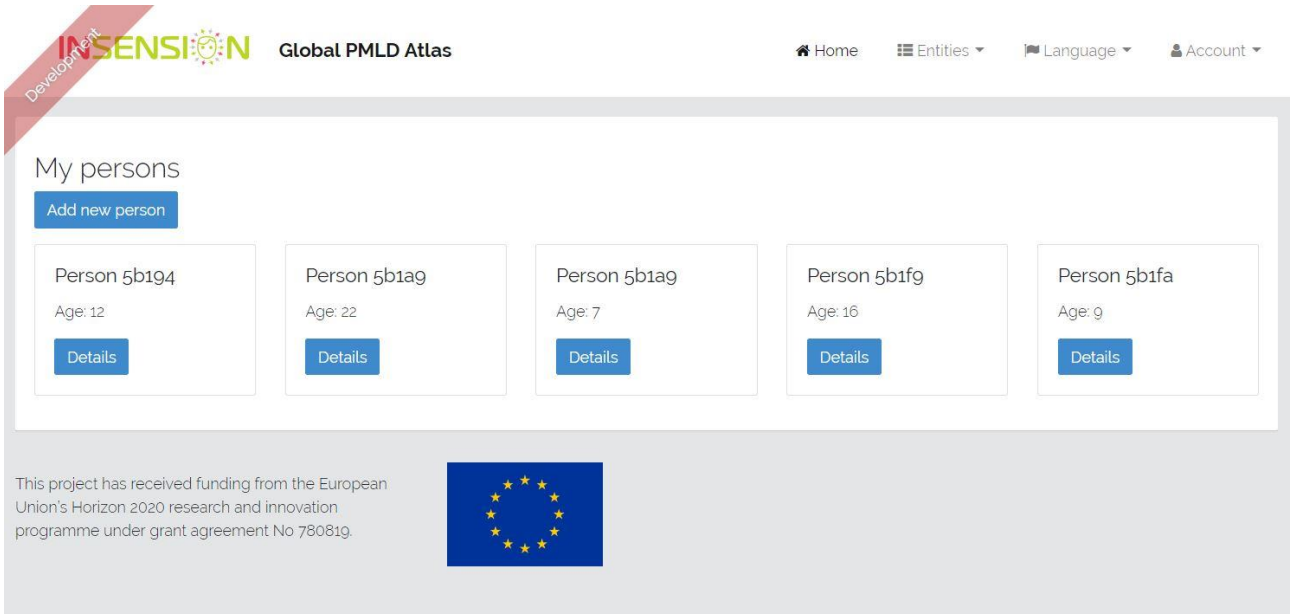

Figure 4.1. List of individuals with PMLD related to the current user of the Atlas (researcher entering the data to the Atlas)

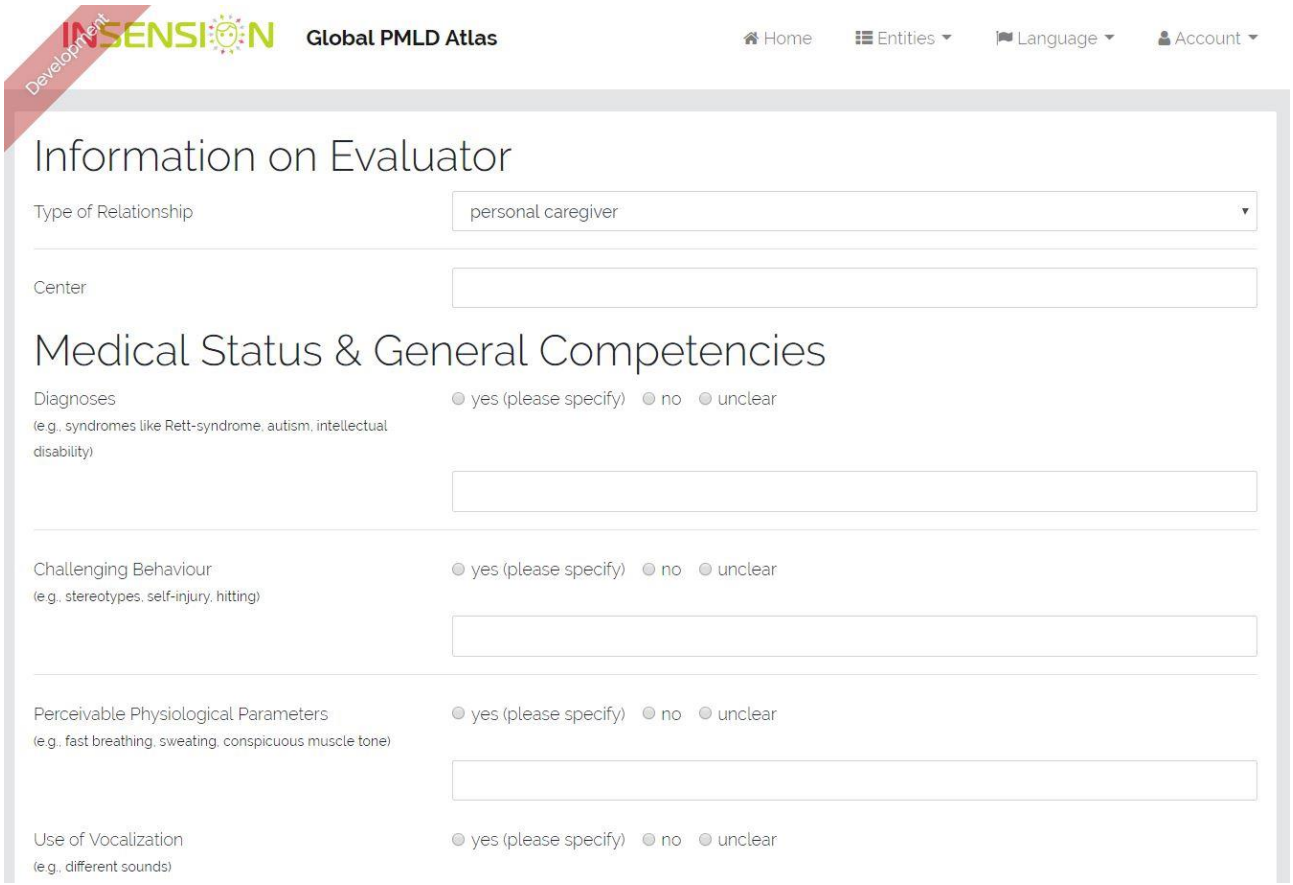

Figure 4.2. Entering data: creating new record

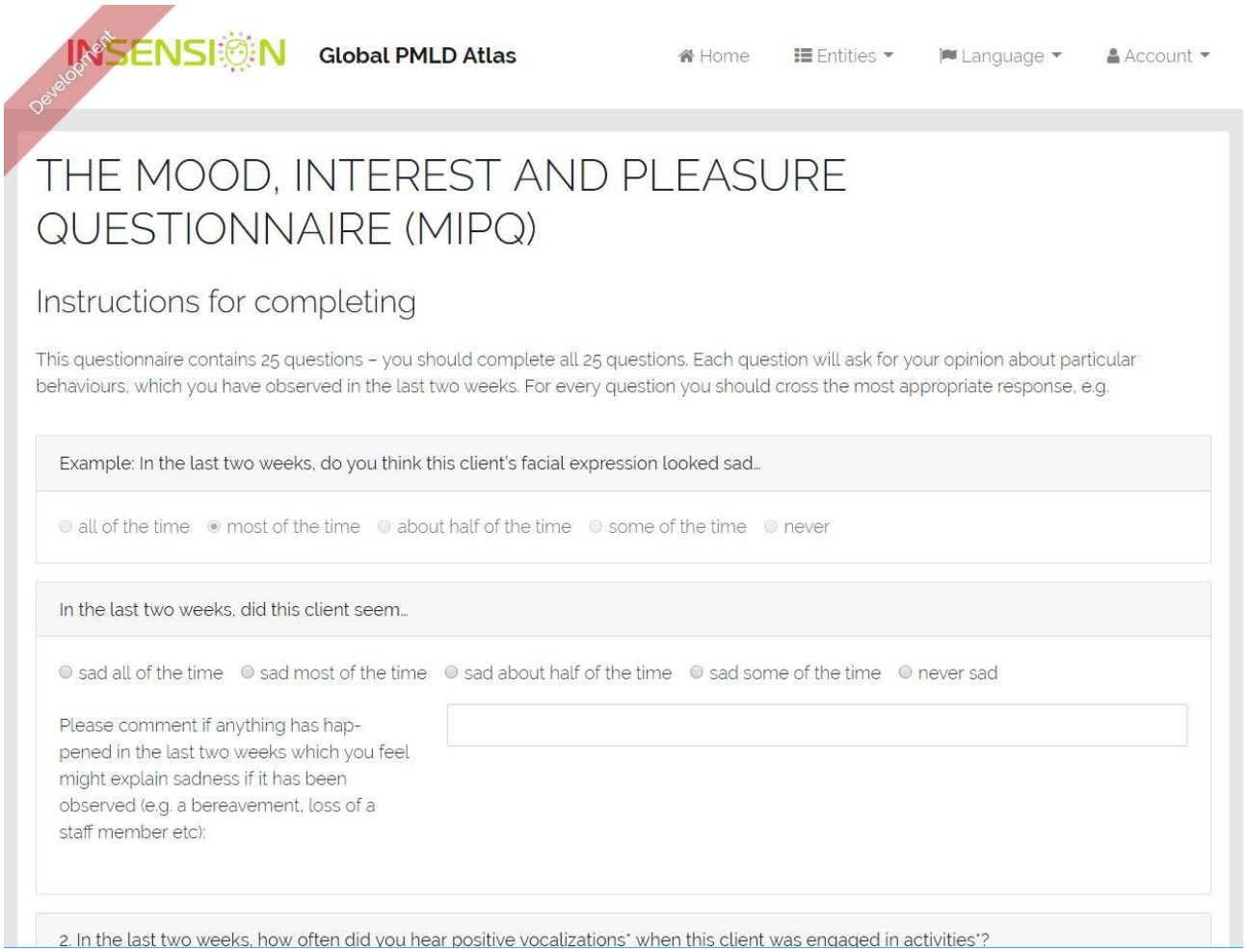

Figure 4.3. Entering data: mood, interest and pleasure section

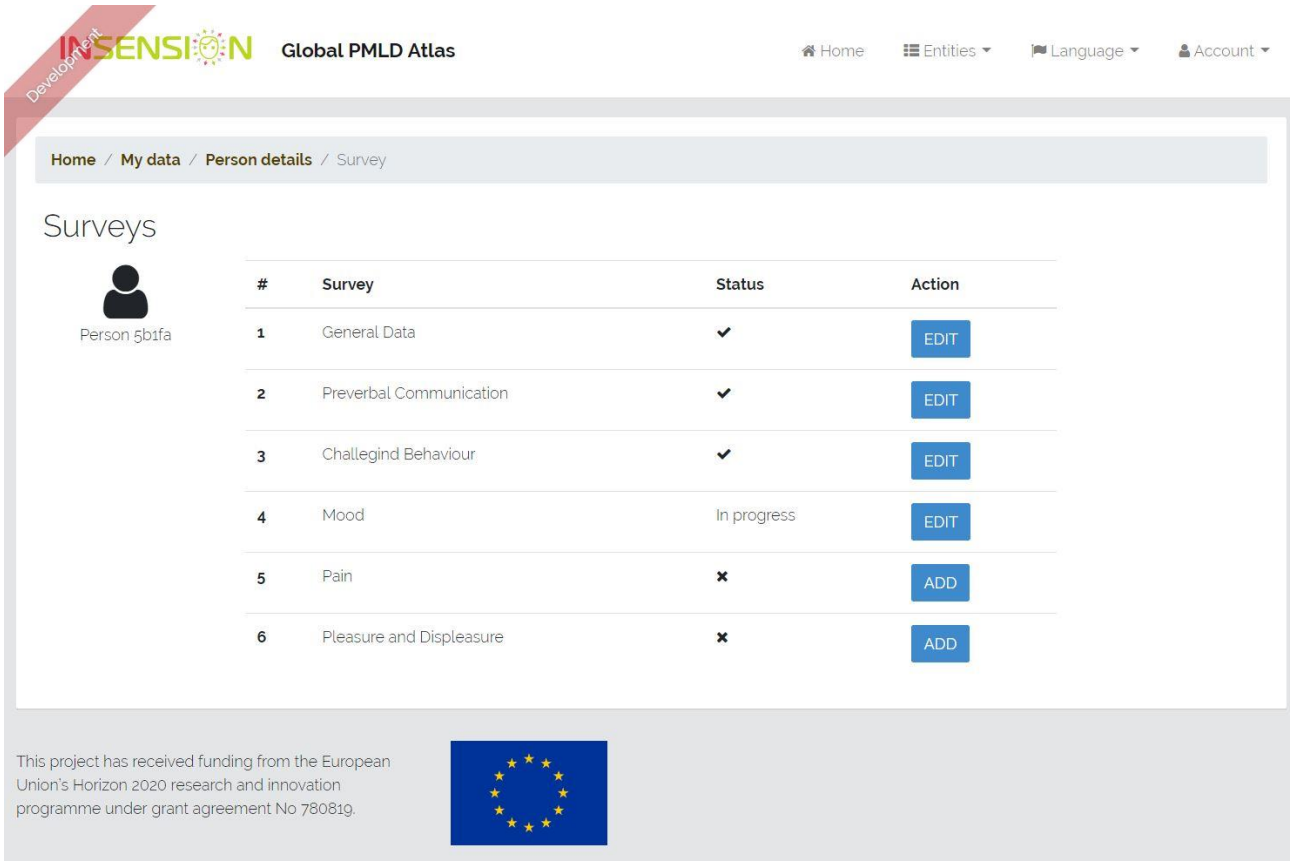

Figure 4.4. Entering data: record status screen

The Atlas has been implemented within WP5 (as part of deliverable D5.1) as a web application coded with the use of the Java programming language.

4.2 PEDAGOGICAL PASSPORT APP

One conceivable application of the ECP is the Pedagogical Passport App (PPA) that provides access to the database of ECP records of a specific person with PMLD within everyday care scenarios in a similar way as the INSENSION system. The caregiver can use the information given in the ECP when uncertainties occur concerning the shown behaviour signals of the person with PMLD. The caregiver can choose between three differently filtered ways of having the needed information displayed (see figure 4.5.) as explained subsequently by means of examples:

a) The person with PMLD shows a specific facial expression that is unfamiliar to the caregiver who can now choose the filtering according to technological areas and search for the shown facial expression to get its presumable meaning.
b) The caregiver interprets the behaviour of the person with PMLD in a specific way, e.g., assumes that the person is in pain. The filtering is now selectable according to potential meaning to have displayed which behaviour signals this individual with PMLD in fact shows in cases of pain.
c) The person with PMLD shows for example signs of displeasure in an eating situation. So, the caregiver can now choose the filtering according to the given context to see if there is any important information like reluctances or routines that should have been taken into account.

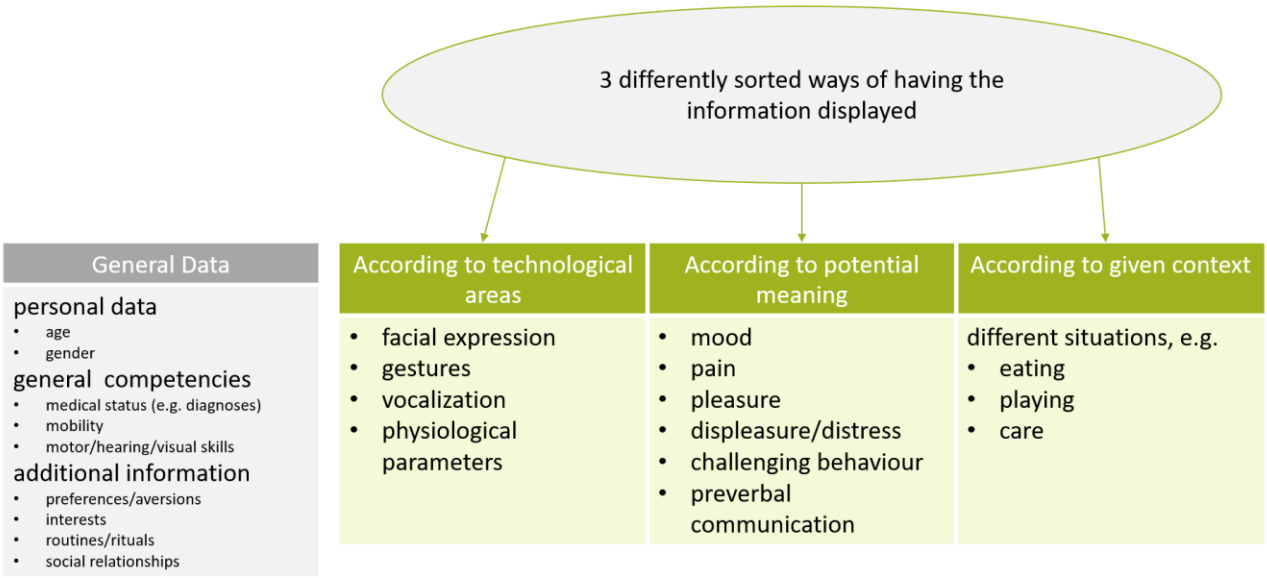

Figure 4.5. Concept of the Pedagogical Passport App

Regardless of the way of filtering the caregiver always has access to the section General Data to see if there are any important issues that need to be considered when interacting with the person with PMLD.

5 CONCLUSION

The ECP as proposed by us herewith is based on the concept of the proven Personal Communication Passport (Millar 1997). It expands this system by applying a more comprehensive assessment system for evaluating a person with PMLD and consequently using state-of-the-art technologies. This allow to create an innovative tool which contributes to a better understanding of the needs of people with PMLD, through collecting information in structured records, easily shared between computer applications and readable by humans at the same time.

Furthermore, the capability of easy exchanging of information collected within ECPs creates an opportunity for constructing a range of applications helping to build new quality of care of people with PMLD. We discussed some of these applications herewith: the Global PMLD Atlas, which is the subject of work in WP5, and a vision of an example pedagogical passport app, which we will consider in our further works in WP1 and WP4.

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APPENDIX A. ECP DATA FORMAT

In the current appendix we present an example of an ECP record using the version of ECP data format as it stands at the time of writing of this report[1]. Due to the length of the actual JSON schema, the latter has been made available on the project website.

```
{
	"Person": {
		"id": "5b1fa",
		"gender": "male",
		"birthYear": "2008"
		"comment": ""
		"evaluator": "personal caregiver"
	},
	"MedicalCharacteristics": {
		"Diagnoses": {
			"response": "yes",
			"comment": "Struge-Weber syndrome"
		},
		"ChallengingBehaviour": {
			"response": "no"
		},
		"PerceivablePhysiologicalParameters": {
			"response": "no"
		},
		"UseOfVocalization": {
			"response": "yes"
		},
		"UseOfFacialExpression": {
			"response": "yes"
		},
		"UseOfGestures": {
			"response": "no"
		},
		"MotorsSkills": {
			"cannotWalk": "yes",
			"canWalkWithHumanHelp": "no",
			"canWalkWithWalkingAid": "no",
			"canWalkIndependently": "no"
		},
		"HearingSkills": {
			"hearingImpairment": "yes",
			"deafness": "no"
		},
		"VisualSkills": {
			"visualImpairment": "no",
			"blindness": "yes",
			"comments": "he sees light lightly in his right eye, he can
not see the left. He has glasses."
		},
		"GastrointestinalDifficulties": {
			"response": "yes",
```

[1] We assume that the ECP and its implementation as described in the current report are the project's proposal towards the PMLD research community and may be modified through relevant scientific discussion

```
                "comment": "Stomach problems"
            },
            "HeartAbnormalities": {
                "response": null
            },
            "LungOrRespiratoryProblems": {
                "response": "no"
            },
            "SkinProblems": {
                "response": "yes",
                "comment": "he has hemangione on the face"
            },
            "Epilepsy": {
                "response": "yes"
            },
            "CerebralPalsy": {
                "response": "no"
            },
            "CurrentMedications": {
                "response": "yes",
                "comment": "Anti-epileptic, espumissan, when he has stomach problems."
            },
            "FurtherComments": null,
            "ImportantPreferences": ["He likes delicate and nice to touch materials ", "He preference touch another person",
            "He like spiced food , and sweet drinks", "He like massage", "He like play in warm water"],
            "ImportantDislikes": ["He dislikes full diaper", "He dislikes play in cold water", "He dislikes tea", "He dislikes cold food" ],
            "ImportantRoutines": ["incentives by changing positions (verbal and touch )", "when he is sleeping, he falls asleep on a swing or in a stroller"],
            "SpecialSympathies": ["He likes everybody", "He likes a delicate and warm objects and structures"],
            "Antipathies": ["He dislikes cold items and structures"],
            "FurtherComments": null
      },
      "Communication": {
            "ExpressDiscomfort": {
                "BodyChangesInPosture" : "mastered",
                "BodyLimbMovements": "emerging",
                "BodyHeadMovement": "not used",
                "EarlySounds": "emerging",
                "FacialExpressions": "not used",
                "Comments": "when he has a headache he tenses and nervously vocalises, and sometimes rubs his hand over his head"
            },
            "ExpressComfort": {
                "BodyChangesInPosture" : "emerging",
                "BodyLimbMovements": "not used",
                "BodyHeadMovement": "not used",
                "EarlySounds": "emerging",
                "FacialExpressions": "not used",
                "Comments": "When he is happy he smiles and sometime hugs, and sometimes vocalise"
            },
            "InterestInOtherPeople": {
```

```
                "BodyChangesInPosture" : "emerging",
                "BodyLimbMovements": "emerging",
                "EarlySounds": "emerging",
                "FacialExpressions": "emerging",
                "Comments": "He is interested other persone, he hugs and
touches them with his hands"
            },
            "Protests": {
                "BodyHeadMovement": "emerging",
                "ArmMovements": "emerging",
                "LegMovements": "emerging",
                "MovesAway": "emerging",
                "EarlySounds": "mastered",
                "FacialExpressions": "emerging",
                "Comments": "when he does not want to eat or drink, he closes
his lips, turns his head."
            },
            "ContinuesAnAction": {
                "BodyHeadMovement": "emerging",
                "ArmMovements": "emerging",
                "LegMovements": "emerging",
                "EarlySounds": "mastered",
                "FacialExpressions": "emerging",
                "Visual": "not used",
                "Comments": null
            },
            "ObtainsMoreOfSomething": {
                "AproachesObject": "emerging",
                "BodyHeadMovement": "emerging",
                "ArmMovements": "emerging",
                "LegMovements": "emerging",
                "EarlySounds": "mastered",
                "FacialExpressions": "emerging",
                "Visual": "not used",
                "Comments": "he likes vibrating massage, sometimes he looks
for a device with his hand."
            },
            "AttractsAttention": {
                "AproachesPerson": "emerging",
                "BodyHeadMovement": "emerging",
                "ArmMovements": "emerging",
                "LegMovements": "emerging",
                "EarlySounds": "mastered",
                "FacialExpressions": "emerging",
                "Visual": "not used",
                "Comments": null
            },
            "RefusesOrRejectsSomething": {
                "WholeBodyMovements": "emerging",
                "BodyHeadMovement": "emerging",
                "ArmOrHandMovements": "emerging",
                "LegMovements": "emerging",
                "EarlySounds": "mastered",
                "FacialExpressions": "emerging",
                "SimpleGestures": "not used",
                "Comments": null
            },
```

```
"RequestsMoreAction": {
      "WholeBodyMovements ": "emerging",
      "ArmOrHandMovements": "emerging",
      "FacialExpressions": "emerging",
      "SimpleGestures": {
            "takesYourHand": "not used",
            "touchesYou": "not used",
            "reachesToward": "not used"
      },
      "Visual": "not used",
      "Comments": null
},
"RequestsNewAction": {
      "WholeBodyMovements ": "emerging",
      "ArmOrHandMovements": "emerging",
      "LegMovements": "emerging",
      "EarlySounds": "mastered",
      "FacialExpressions": "emerging",
      "SimpleGestures": "not used",
      "Visual": "not used",
      "Comments": null
},
"RequestsMoreOfAnObject": {
      "WholeBodyMovements ": "emerging",
      "moveHeadTowards": "not used",
      "ArmHandMovements": "not used",
      "LegMovements": "emerging",
      "EarlySounds": "not used",
      "FacialExpressions": "not used",
      "SimpleGestures": "not used",
      "Visual": "not used",
      "Comments": null
},
"MakeChoices": {
      "WholeBodyMovements ": "emerging",
      "moveHeadTowards": "not used",
      "SimpleGestures": {
            "guidesYourHand": "not used",
            "reachesToward": "not used"
      },
      "Visual": "not used",
      "Comments": null
},
"RequestsNewObject": {
      "WholeBodyMovements ": "emerging",
      "moveHeadTowards": "not used",
      "SimpleGestures": {
            "guidesYourHand": "not used",
            "touchesDesiredObject": "not used",
            "reachesToward": "not used"
      },
      "Visual": "not used",
      "Comments": null
},
"RequestsAttention": {
      "EarlySounds": "not used",
      "FacialExpressions": "not used",
```

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                "SimpleGestures": {
                        "armHandMovements": "not used",
                        "activatesSwitch ": "not used",
                        "touchesYou": "not used"
                },
                "Visual": "not used",
                "Comments": null
        },
        "ShowsAffection": {
                "EarlySounds": "not used",
                "FacialExpressions": "not used",
                "SimpleGestures": {
                        "armHandMovements": "not used",
                        "touchesYou": "not used"
                },
                "Visual": "not used",
                "Comments": null
        }
},
"AberrantBehaviour": {
        "ExcessivelyActive": "not-a-problem",
        "InjuresSelf": "not-a-problem",
        "Inactive": "slight-problem",
        "Aggressive": "not-a-problem",
        "SeeksIsolation": "not-a-problem",
        "MeaninglessBodyMovement": "not-a-problem",
        "Boisterous": "not-a-problem",
        "ScreamsInappropriately": "not-a-problem",
        "TalksExcessively": "not-a-problem",
        "TemperTantrums": "not-a-problem",
        "StereotypedBehaviour": "not-a-problem",
        "Preoccupied": "not-a-problem",
        "Impulsive": "not-a-problem",
        "Irritable": "not-a-problem",
        "Restless": "not-a-problem",
        "Withdrawn": "not-a-problem",
        "Odd": "not-a-problem",
        "Disobedient": "not-a-problem",
        "Yells": "not-a-problem",
        "FixedFacialExpression": "not-a-problem",
        "DisturbsOthers": "not-a-problem",
        "RepetitiveSpeech": "not-a-problem",
        "DoesNothingButSit ": "not-a-problem",
        "Uncooperative": "not-a-problem",
        "DepressedMood": "not-a-problem",
        "ResistsAnyForm ": "not-a-problem",
        "RollsHeadBack": "slight-problem",
        "NotPayAttentionToInstructions": "not-a-problem",
        "DemandsMustBeMetImmediately": "not-a-problem",
        "IsolatesHimself": "not-a-problem",
        "OnePositionForAlongTime": "not-a-problem",
        "TalksToSelfLoudly": "not-a-problem",
        "CriesOverMinorAnnoyances": "not-a-problem",
        "RepetitiveMovements": "not-a-problem",
        "MoodChangesQuickly": "not-a-problem",
        "UnresponsiveToActivities": "not-a-problem",
        "DoesNotStayInSeat": "not-a-problem",
```

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        "WillNotSit": "not-a-problem",
        "DifficultToreach": "not-a-problem",
        "CriesAndScreams": "not-a-problem",
        "NotTryToCommunicateByWardsOrGestures": "not-a-problem",
        "EasilyDistractible": "not-a-problem",
        "WavesOrShakesTheExtremities": "not-a-problem",
        "RepeatsAword": "not-a-problem",
        "StampsFeetOrBangsObjectsOrSlamsDoors": "not-a-problem",
        "ConstantlyRunsOrJumpsAroundTheRoom": "not-a-problem",
        "RocksBodyBack": "not-a-problem",
        "Deliberately": "not-a-problem",
        "PaysNoAttention": "not-a-problem",
        "DoesPhysicalViolence": "not-a-problem",
        "InactiveNeverMoves": "not-a-problem",
        "TendsToBeExcessivelyActive": "not-a-problem",
        "DeliberatelyIgnoresDirections": "not-a-problem",
        "HasTemperOutbursts": "not-a-problem",
        "ShowsFewSocialReactions": "not-a-problem",
    },
    "MoodInterestPleasure": {
        "DidThisClientSeem": {
            "response": "sadSomeOfTheTime",
            "comment": "He has headache"
        },
        "HearPositiveVocalizations": {
            "response": "aboutHalfOfTheTime",
            "comment": null
        },
        "ClientsFacialExpressions": {
            "response": "interestedAboutHalfOfTheTime",
            "comment": null
        },
        "FacialExpressionLookedFlat": {
            "response": "never",
            "comment": null
        },
        "BeenEnjoyingLife": {
            "response": "aboutHalfOfTheTime",
            "comment": "He was illness"
        },
        "SeekOutTheAttention": {
            "response": "onceOrTwiceEachWeek",
            "comment": null
        },
        "WouldYouSayThisClient": {
            "response": "criedLessThanOnceEachWeek",
            "comment": null
        },
        "ClientAppearToBeInHisHerSurroundings": {
            "response": "interestedSomeofTheTime",
            "comment": null
        },
        "FacialExpressionLookedHappy": {
            "response": "aboutHalfOfTheTime",
            "comment": null
        },
        "HowOftenDidThisClientRefuseToParticipate": {
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                "response": "onceOrTwiceEachWeek",
                "comment": null
        },
        "WouldYouSayThisClientSmiled": {
                "response": "3-4timesEachWeek",
                "comment": null
        },
        "HowDisinterestedDidThisClientSeem": {
                "response": "disinterestedSomeOfTheTime",
                "comment": null
        },
        "DidThisClientsVocalizations": {
                "response": "sadSomeOfTheTime",
                "comment": null
        },
        "FacialExpressionsEnjoyingHim": {
                "response": "enjoyingHimSomeOfTheTime",
                "comment": null
        },
        "DidThisClientSeem": {
                "response": "happySomeOfTheTime",
                "comment": null
        },
        "ClientWasEngagedInActivities": {
                "response": "interestedSomeOfTheTime",
                "comment": null
        }
},
"NCPain": {
        "Whimpering": {
                "nonpainful": "not-at-all",
                "painful": "just-little"
        },
        "Crying": {
                "nonpainful": "not-at-all",
                "painful": "just-little"
        },
        "Screaming": {
                "nonpainful": "not-at-all",
                "painful": "fairly-often"
        },
        "SORpain": {
                "nonpainful": "not-at-all",
                "painful": "not-at-all"
        },
        "NotCooperating": {
                "nonpainful": "not-applicable",
                "painful": "not-applicable"
        },
        "LessInteraction": {
                "nonpainful": "not-applicable",
                "painful": "not-applicable"
        },
        "SeekingComfort": {
                "nonpainful": "not-at-all",
                "painful": "not-at-all"
        }
```

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	},
	"PleasureAndDispleasure": {
		"SoundsInGeneral": {
			"SoundsOfPleasure": {
				"volume": "medium",
				"pitch": "medium",
				"duration": "intermittent",
				"sounds": "'aaaaaaa' with smile"
			},
			"SoundsOfDispleasure": {
				"volume": "medium",
				"pitch": "medium",
				"duration": "intermittent",
				"sounds": "'mhymhymhy' with crying ora a nervous movment"
			}
		},
		"AppearanceInGeneral": {
			"AppearanceOfPleasure": {
				"response": ["smiling"],
				"comments": null
			},
			"AppearanceOfDispleasure": {
				"response": ["grimace"],
				"comments": null
			}
		},
		"AppearanceInEyes": {
			"AppearanceOfPleasure": {
				"response": null,
				"comments": "he can not see"
			},
			"AppearanceOfDispleasure": {
				"response": null,
				"comments": "He can not see"
			}
		},
		"MovementOfJaw": {
			"MovementOfPleasure": {
				"response": ["relaxed"],
				"comments": null
			},
			"MovementOfDispleasure": {
				"response": ["rigid"],
				"comments": null
			}
		},
		"MovementOfNoseAndMouth": {
			"MovementOfPleasure": {
				"response": ["lip movements", "tongue outside"],
				"comments": null
			},
			"MovementOfDispleasure": {
				"response": ["mouth tense"],
				"comments": null
			}
		},
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            "BodyPosture": {
                  "MovementOfPleasure": {
                        "response": ["movement change"],
                        "comments": null
                  },
                  "MovementOfDispleasure": {
                        "response": ["rigid/no movement", "restless", "tense"],
                        "comments": null
                  }
            },
            "MovementOfHead": {
                  "MovementOfPleasure": {
                        "response": ["movement change"],
                        "comments": null
                  },
                  "MovementOfDispleasure": {
                        "response": ["movement change", "withdrawn",
"shaking","nodding"],
                        "comments": null
                  }
            },
            "MovementOfHandsAndArms": {
                  "PostureOfPleasure": {
                        "response": ["normal"],
                        "comments": null
                  },
                  "MovementOfDispleasure": {
                        "response": ["movement change", "rubbing", "hands on
ears","nodding"],
                        "comments": "rubbing other part body"
                  }
            },
            "MovementOfFeetAndLegs": {
                  "PostureOfPleasure": {
                        "response": ["normal", "rubbing"],
                        "comments": "rubbing your legs , he can not walk"
                  },
                  "MovementOfDispleasure": {
                        "response": ["rigid/no movement", "movement change",
"kicking"],
                        "comments": "he can not walk"
                  }
            },
            "SkinAppearance": {
                  "AppearanceOfPleasure": {
                        "response": ["normal"],
                        "comments": null
                  },
                  "AppearanceOfDispleasure": {
                        "response": ["normal"],
                        "comments": null
                  }
            },
            "BodyObservations": {
                  "ObservationsOfPleasure": {
                        "pulse": "normal",
                        "breathing": "normal",
```

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                        "sleep": "He sleeps in the morning after arriving from
home in kinder-garten",
                        "appetite": "He likes eat",
                        "eatingPattern": "He eats everything"
                  },
                  "Observations of Displeasure": {
                        "pulse": "normal",
                        "breathing": "normal",
                        "sleep": "when something hurts him he has a short nap in
kindergar-ten",
                        "appetite": "He reluctantly eating them",
                        "eatingPattern": "He doesn’t eat"
                  }
            }
      }

}
```