

Mobility Data Model. Definitions.

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1 Introduction

The main purpose of this document is to present data model related to student mobility. For the first time this model was introduced in [Kra07] and after few changes was used in the Mobility Project (see [Nag09]). Definitions, terms and entities in this document mostly come from [Kra07], but some of them have been changed to meet requirements defined in [Nag09].

The data model is presented from the point of view of institution that is deploying Mobility, but almost always there are at least two organizations involved in the mobility process. Therefore, for the sake of clarity, some terms (Organizational Unit, Person) are used with one of two adjectives:

- 'home' – denotes, that this term is associated with the organization deploying Mobility and from which point of view activities related to international cooperation (including student and employee mobility) are performed (e.g. if we are acting on behalf of the University of Warsaw then it is called 'home organization' and even if we are dealing with a German student who studies in Warsaw then 'home supervisor' is a staff member from the University of Warsaw);
- 'external' or 'partner' – denotes, that this term is associated with the other organization taking part in the mobility process.

For example, when a list of students from the University of Warsaw nominated for studies at the University of Parma is being sent from Warsaw to Parma, then the University of Warsaw is 'home organization' and the University of Parma is 'partner organization'. However when Warsaw sends to Parma transcripts of records of Italian students who have spent a semester in Warsaw then the University of Parma is 'home organization' and the University of Warsaw is 'partner organization' (context of information is important, transcripts of records being sent contain grades of Italian students for whom the University of Parma is the home institution).

2 Abbreviations

HEI – Higher Education Institution,

IRO – International Relations Office.

3 Definitions

In this chapter there are listed the most important terms related to international cooperation and student mobility.

Exchange Programme – set of purposes and tasks established in order to achieve certain results. From the Mobility point of view 'programme' stands for international academic exchange programme between HEIs. Examples of exchange programmes are: 'CEEPUS' or 'ERASMUS'. Programme can be part of another programme called 'master programme'.

Exchange Project – set of persons, institutions and undertakings characterized by the following features:

1. they are bind together in a complex way,
2. ways of achieving goal change, often by generating a unique service, product or result,
3. they have pre-planned budget and schedule.

Projects are created in exchange programmes and are funded by these programmes. Projects form a network of inter-university cooperation, which structure is determined by the exchange programme. Home organization can play in exchange project one of three roles (called home organization status): Coordinator, Partner or Contractor.

Agreement – an arrangement between two or more parties (organization, country, person, organizational unit), that settles their rights and responsibilities.

Academic Period – part of academic year (e.g. winter semester, first trimester, academic year).

Conditions (of cooperation) – part of agreement defining rights and responsibilities in the area affected by it.

Contractor – person (organization's employee) responsible for project's funds. At the University of Warsaw it is usually vice-rector responsible for international cooperation.

Coordinator – person (organization's employee) responsible for realization of a given undertaking (programme, project, agreement) at this undertaking level (e.g. agreement coordinator). At the University of Warsaw this can be employee of faculty involved in the undertaking.

Institutional Coordinator – person (organization's employee) responsible for realization of a given undertaking (programme, project, agreement) at the level of organization. At the University of Warsaw it is usually head of IRO.

Organization – organization that is taking part in the mobility process. In most cases it will be HEI but it can be any other organization/institution (e.g. bank where student's internship takes place).

Supervisor – research fellow (academic fellow) assigned by the dean/head for scientific contacts (assistance in selecting courses, creating research programme etc.).

Tutor – person assigned by the dean/head for assistance in organising foreigner's stay (dealing with administrative issues, medical attention etc.).

4 Data model

Student mobility data model can be divided into three main parts: agreements, arrivals, departures. The first section of this chapter contains information that should be stored for each part. The second section contains diagrams presenting students mobility data model.

4.1 Informational requirements

4.1.1 Agreements

The exchange of persons is possible only on the basis of signed agreements. Each agreement is characterized by the following attributes:

1. **number** – text uniquely identifying the agreement at home institution,
2. **start date** as originally planned,
3. **end date** as originally planned,
4. **date signed** – can be different from the start date,
5. **status** – describing current state of the agreement (e.g. signed, not signed by a partner),
6. **agreement home coordinator**,
7. **agreement home institutional coordinator**,
8. **agreement partner coordinator**,
9. **agreement partner institutional coordinator**,
10. **home organizational units** – sides of agreement,
11. **partner organizational units** – sides of agreement,
12. **agreement type** – IRO at the University of Warsaw defines five types of agreements and further informational requirements for each type:
 - (a) **bilateral** agreement: **partner organization** – side of the agreement, organization's **country** of origin,
 - (b) **governmental** agreement: **country** – side of the agreement,
 - (c) **individual** agreement: **external person** – side of the agreement, **organization** associated with this person,
 - (d) agreement under **exchange project**: **exchange project** under which the agreement is signed,
 - (e) **faculty** agreement: **partner organization** – side of agreement, organization's **country** of origin.

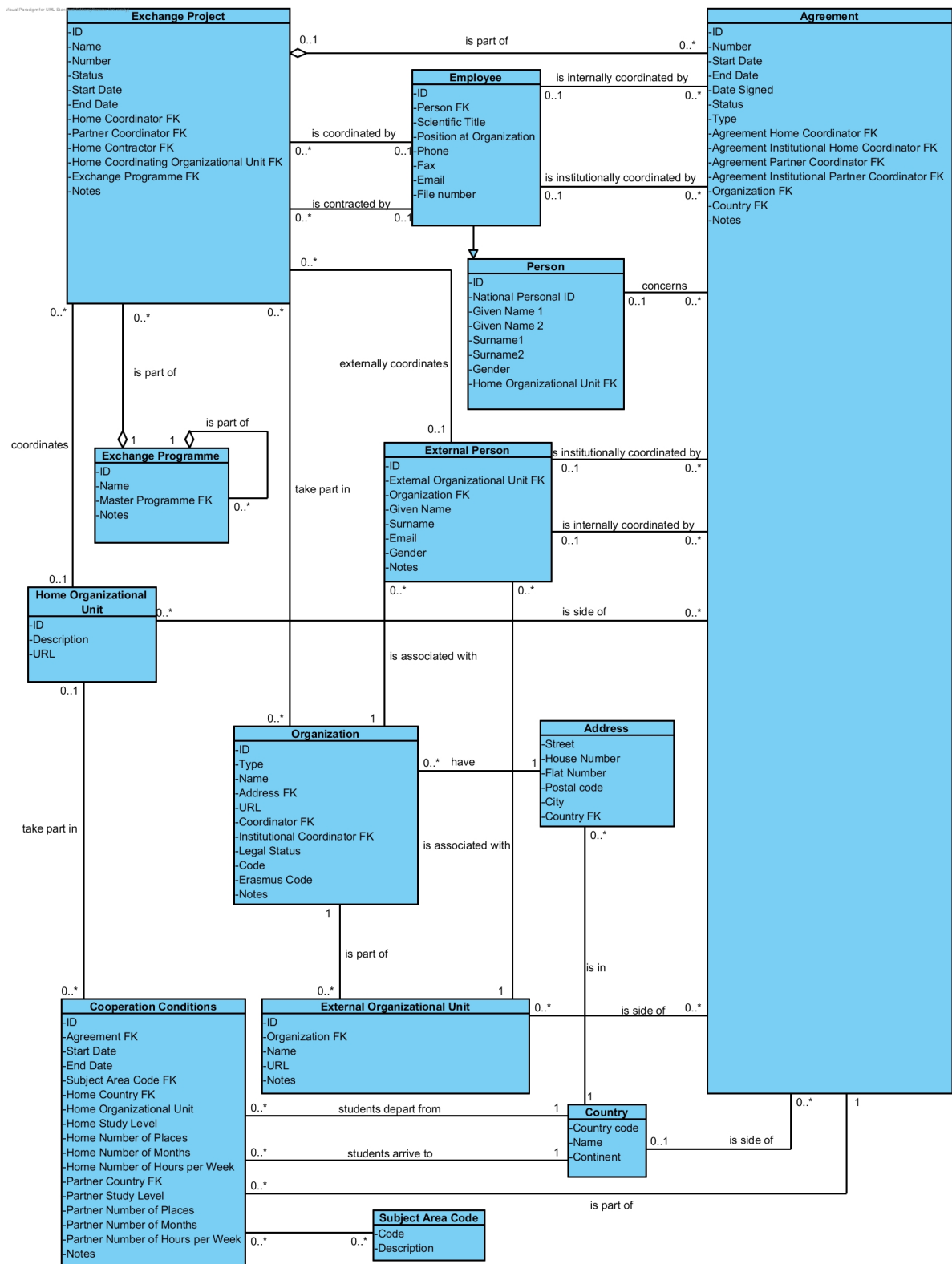


Figure 1: Agreements

13. **cooperation conditions** – defined for all types of agreements except individual agreements. Should contain the following informations:

- (a) cooperation's **start and end dates**,
- (b) **organizations** involved in the agreement,
- (c) **organizational units** of the organizations, which are involved in the agreement,
- (d) **countries** involved in the agreement,
- (e) **subject area codes**,
- (f) **programme participants** (e.g. students, Ph.D. students etc.),
- (g) **home and partner level of studies** (if cooperation involves students),
- (h) **number of persons** that can be involved in exchange under the agreement,
- (i) **number of months** programme participants can spent at partner institution,
- (j) **number of weeks** programme participants can spent at partner institution (usually applies to academic teachers and researchers),
- (k) **number of hours** programme participants can spent at partner institution (usually applies to academic teachers and researchers).

4.1.2 Arrivals

An arrival always involves only one person and only one agreement. Each arrival is characterized by the following attributes:

- 1. **number** – text uniquely identifying the arrival at home institution (hosting the arrival),
- 2. **arriving person**,
- 3. **start date**,
- 4. **end date**,
- 5. **arrival date** – can be different from start date,
- 6. **departure date** – can be different from end date,
- 7. **state of the arriving person** – describing state of the arriving person, e.g. qualification for the arrival, arrival, resignation from the arrival,
- 8. **status of the arriving person at home organization** – e.g. student or Ph.D. student,
- 9. **status of the arriving person at partner organization** – e.g. student or Ph.D. student,
- 10. **accommodation** – information about accommodation of the arriving person (organization's hostel, on his/her own),

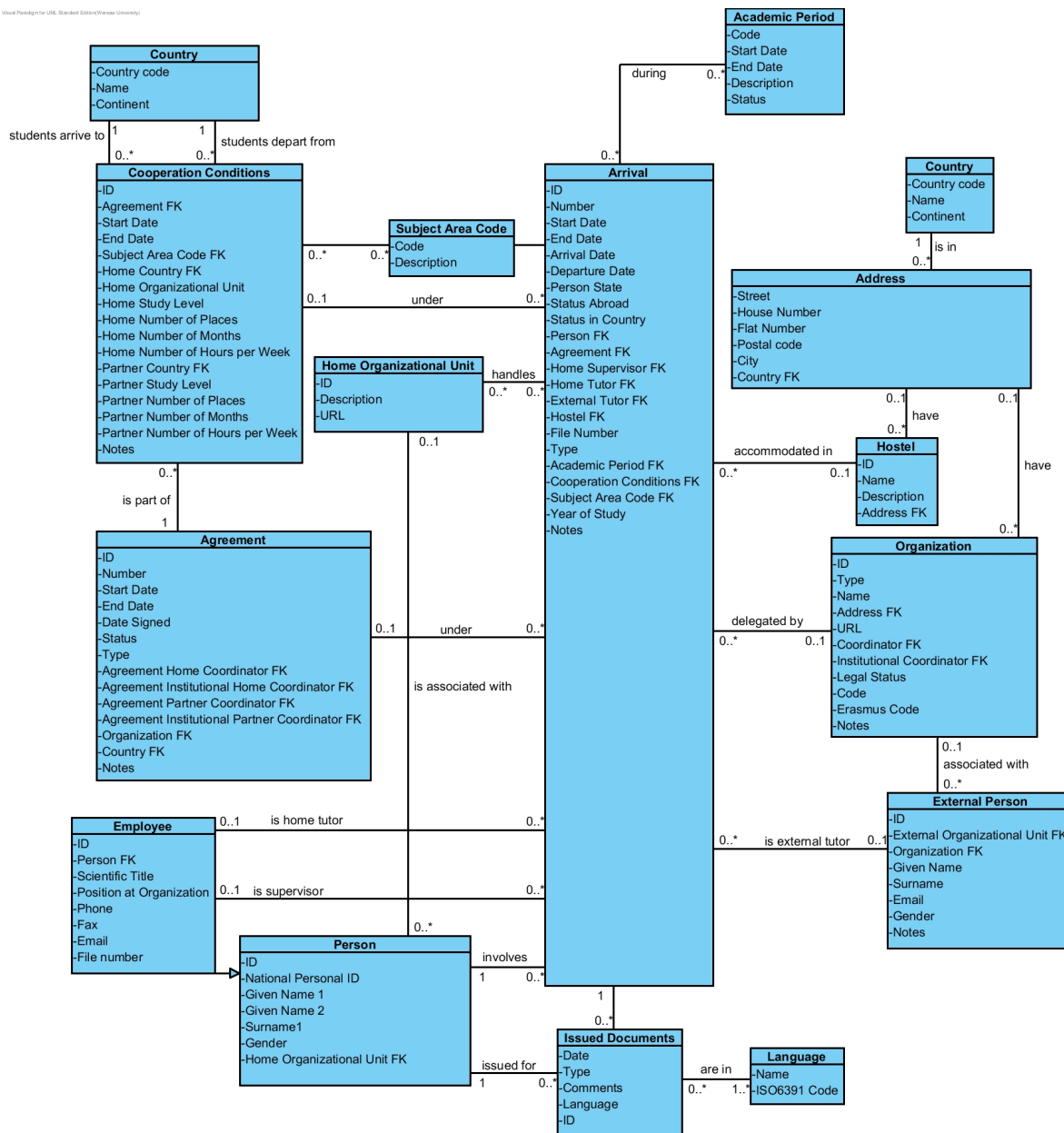


Figure 2: Arrivals

11. **agreement** under which the person arrives,
12. **cooperation conditions** associated with the arrival (only if they are defined in the agreement),
13. **purpose of arrival** e.g. studies, language course, summer school, internship, research, lectures,
14. **external organization** – associated with the arriving person,
15. **external tutor** – tutor from the external organization,
16. **home supervisor**,
17. **home tutor**,
18. **home organizational unit** hosting the arrival,
19. **documents** issued to the arriving person,
20. **file number** (of the paper documentation),
21. **year of study** of the arriving student,
22. **academic period** during which arrival takes place (e.g. winter semester 2010/2011).

4.1.3 Departures

A departure always involves only one person and only one agreement. Each arrival is characterized by the following attributes:

1. **number** – text uniquely identifying the departure at home institution (sending student),
2. **leaving person**,
3. **home organizational unit** sending the leaving person,
4. **academic period** during which the departure takes place (e.g. winter semester 2010/2011).
5. **programme** of studies of the leaving person,
6. **HEI** to which student is going,
7. **agreement** under which the person is leaving,
8. **cooperation conditions** under which the person is leaving,
9. **type of departure** e.g. studies, language course, summer school, internship, research, lectures,
10. **file number** (of the paper documentation),

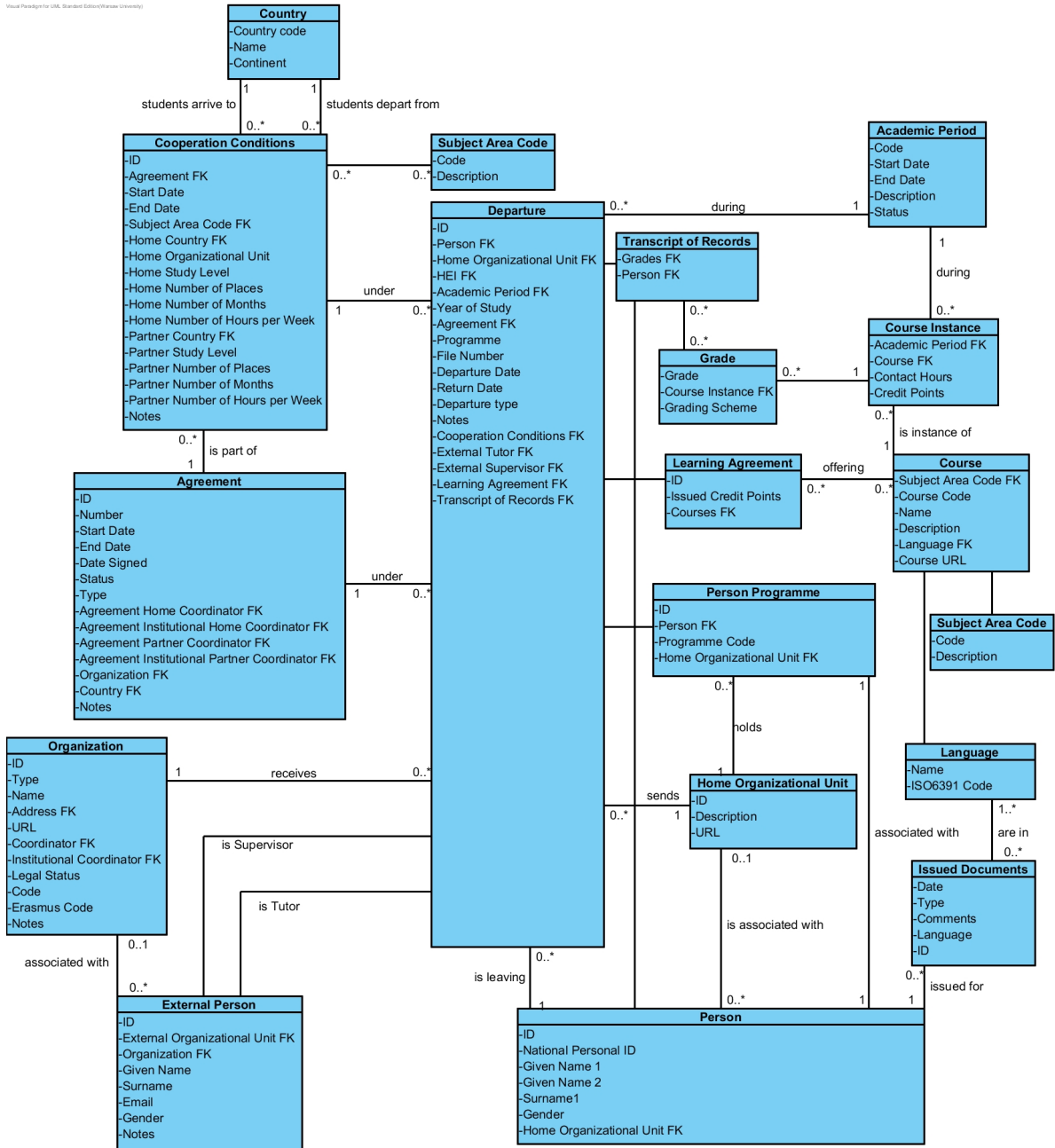


Figure 3: Departures

11. **year of study** of the leaving student,
12. **departure date**,
13. **return date**,
14. **external supervisor**,
15. **external tutor**,
16. **learning agreement**,
17. **transcript of records**.

5 Mapping on Mobility WSDL

This chapter presents correspondence between data model introduced in the previous section and data types used in The Mobility Project. The later ones are well described in [Nag09] and their technical definitions in the XML format are available at [MobWSDL]. Data type definitions in Mobility WSDL are divided into some groups and mapping of each of these group is shown in Tables 1 – 6. The group 'general auxiliary elements and element groups' is omitted because it contains only data types introduced to make transfer of data easier. Groups with names starting from 'get/send' are merged into one group shown in Table 6. In the following tables the first column contains entities from the presented data model, the second one elements from Mobility WSDL, while the third one provides some additional comments.

Data Model	WSDL	Comment
Type: <i>Country</i> , field: <i>Country Code</i>	countryCodeT	
Type: <i>Language</i> , field: <i>ISO6391 Code</i>	languageCodeT	
NA	nameT	This type is introduced in WSDL to constrain available content of some elements.
NA	countryCodeorIntT	This type is introduced in WSDL to constrain available content of some elements.
NA	internationalizedStringT	This type is introduced in WSDL to constrain available content of some elements.
NA	domainT	This type is introduced in WSDL to constrain available content of some elements.
Nothing	academicPeriodT	It's not equivalent to <i>Academic Period</i> type in the data model, see <i>academicPeriodSinceT</i> .
NA	nonNegativeFloatT	This type is introduced in WSDL to constrain available content of some elements.
NA	positiveIntT	This type is introduced in WSDL to constrain available content of some elements.
Type: <i>Academic Period</i>	academicPeriodSinceT	See <i>academicPeriodT</i> .
Type: <i>Address</i>	addressT	
NA	emailT	

Table 1: General types

Data Model	WSDL	Comment
Type: <i>Person</i> , field: <i>National Personal ID</i>	nationalPersonalIdT	
Type: <i>Person</i> , field: <i>Gender</i>	genderT	It's a data type in WSDL and an attribute in the data model, but they both refer to the same portion of information.
Type: <i>Person</i> / <i>External Person</i>	personalCharacteristicsT	In the data model there isn't a distinction between a person and a student, while in the WSDL there is <i>Person</i> type and its two subtypes: <i>Employee</i> and <i>Student</i> . In the data model there is a distinction between a person and an external person, which is not present in the WSDL. That's why in most cases one WSDL type can be equivalent to <i>Person</i> type and to <i>External Person</i> type.
Type: <i>Employee</i> , field <i>Position at Organization</i>	personalPositionT	
Type: <i>Employee</i> / <i>External Person</i>	employeePersonalCharacteristicsT	See comment to personalCharacteristicsT.
Type: <i>Person</i> / <i>External Person</i>	studentPersonalCharacteristicsT	See comment to personalCharacteristicsT.

Table 2: Personal data related types

Data Model	WSDL	Comment
Type: <i>Organization</i> , field: <i>Type</i>	organizationTypeT	
Type: <i>Organization</i> , field: <i>URL</i>	organizationIdT	In the Mobility Project URL is used to identify organizations.
Type: <i>Organization</i> , field <i>URL</i> + type: <i>Person</i> / <i>External Person</i> , field: <i>ID</i>	organizationalPersonalIdT	WSDL documentation: unique identifier of a person within an organization.
Type: <i>Organization</i>	organizationDataT	

Table 3: Organization related types

Data Model	WSDL	Comment
Type: <i>Subject Area Code</i>	subjectAreaCodeT	
Type: <i>Course</i> , field: <i>Course Code</i>	courseCodeT	
Type: <i>Learning Agreement</i> , field: <i>Issued Credit Points</i>	studyCreditsT	
Type: <i>Course Instance</i> , field: <i>Contact Hours</i>	contactHoursT	
Type: <i>Course</i>	courseDataT	
Type: <i>Course Instance</i>	courseInstanceT	
Type: <i>Grade</i>	gradeT	
Type: <i>Cooperation Conditions</i> , field: <i>Home/External Study Level</i>	studyLevelT	
NA	academicYearT	This information is incorporated into <i>Academic Period</i> type

Table 4: Course related types

Data Model	WSDL	Comment
Type: <i>Agreement</i> , field: <i>ID</i>	localAgreementIdT	
Type: <i>Agreement</i> , field: <i>Number</i>	agreementIdT	
Type: <i>Cooperation Conditions</i> , field: <i>ID</i>	cooperation-ConditionsIdT	
Type: <i>Cooperation Conditions</i>	cooperation-ConditionsT	

Table 5: Agreement related types

Data Model	WSDL	Comment
Type: <i>Agreement</i>	agreementData	Part of agreement informations that doesn't include personal data.
Type: <i>Agreement</i>	agreementData- WithPersonalData	
Type: <i>Arrival</i> , field: <i>Arrival date</i> / type: <i>Departure</i> , field: <i>Departure date</i>	arrivalDate	It depends on the context - for home organization it is departure and for partner organization it is arrival.
Type: <i>Arrival</i> , field: <i>Arrival date</i> / type: <i>Departure</i> , field: <i>Departure date</i>	studentArrivalDate	See comment to arrivalDate.
Type: <i>Arrival</i> , field: <i>Departure date</i> / type: <i>Departure</i> , field: <i>Return date</i>	departureDate	It depends on the context - for home organization it is return from departure and for partner organization it is departure.
Type: <i>Arrival</i> , field: <i>Departure date</i> / Type: <i>Departure</i> , field: <i>Return date</i>	studentDepartureDate	See comment to departureDate
Type: <i>Transcript of Records</i>	courseInstances- WithPersonalData	
Type: <i>Transcript of Records</i>	gradesFromCourses- WithPersonalData	

Table 6: Elements used in get/send operations

6 Final remarks

The mobility data model presented in this document does not intend to be standard. It's purpose is to show how such model can look like. In fact this model is in use at University of Warsaw where it works well. Some parts of it may be influenced by UW standards, so may have to be changed while adopting it at another organization. Another example of such data model can be found in [Van10].

References

- [Kra07] Marcin Krawczyński, *Uniwersytecki System Obsługi Studiów. Biuro Współpracy z Zagranicą: umowy i przyjazdy*. Master's thesis, Institute of Informatics, University of Warsaw, 2006.
- [Nag09] Rafał Nagrodzki, *The Mobility Project*. Master's thesis, Institute of Informatics, University of Warsaw, 2009.
- [MobWSDL] *Mobility WSDL*, <http://usos.edu.pl/Mobility/Project/>

[Van10] Geir Vangen, *Mobility Data Model*, <http://wiki.teria.no/display/~geir.vangen@usit.uio.no>