



John Arlinger

9 November 2011

## Minutes StanForD2010

2011-11-08--09

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Place:        | Skogforsk, Uppsala 10:00-15:00 CET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Participants: | <p>Mikael Eliasson, LogMax<br/>Teemu Paldanius, Ponsse<br/>Pasi Palonen, Parker<br/>Tapio Räsänen, Metsäteho<br/>Timo Melkas, Metsäteho<br/>Hans-Ulrich Dietz, KWF<br/>Joonas Karnametsä, John Deere<br/>Erik Kindlund John Deere<br/>Nazmul Bhuiyan, Skogforsk<br/>Jonas Thorsson, Dasa<br/>Niclas Eriksson, Komatsu (day 1)<br/>Lars Henriksson, SDC<br/>Per Knutsson, Logica</p> <p>Jean Plamondon FPInnovations (phone)<br/>Peter Assarsson, Komatsu (phone day 2)<br/>Halvard Olderlund, Komatsu (phone day 2)<br/>Fredrik Tjernberg, Komatsu (phone day 2)<br/>Daniel Linder, Komatsu (phone day 2)</p> <p>John Arlinger, Secretary<br/>Johan J. Möller, Chairman</p> |

### § 1 Opening of meeting

Johan J Möller opened the meeting. He also wished Logica a special welcome as a new member of StanForD

### § 2 Agenda

The agenda was accepted by the meeting.

### § 3 Decision process autumn 2011

It was decided at the Helsinki meeting in September that: “a new draft version 2.0 is to be created in September 2011 based on the decision at this meeting. The official StanForD meeting in November decides on a new final version 2.0”.

### § 4 Decisions work group meeting 2011-09-13

All decisions at the work group meeting in Helsinki were confirmed with the following exceptions:

#### SHIFT DATA

It was decided not to implement the previous preliminary decisions concerning shift data. An improved proposal is included in § 5.

#### DISTANCE FROM HOME TO LOGGING OBJECT

It was decided not to implement the previous preliminary decisions concerning a new element TravelDistanceOutsideMachine. This type of information was discussed in § 12.

#### OTHER WORK OUTSIDE MACHINE

It was decided not to implement the previous preliminary decisions concerning a new element OtherWorkTimeOperatorCodes. This type of information was discussed in § 12.

#### COMPLETION OF HARVESTING OBJECT

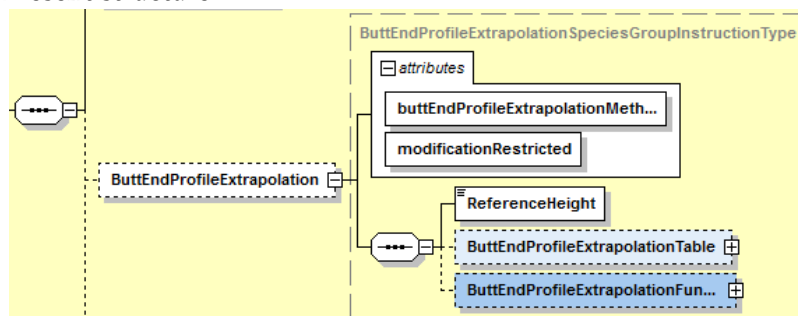
It was decided not to implement the previous preliminary decisions concerning a new element EstimatedEndDate, EstimatedHarvestedArea and EstimatedForwardingDistance. This type of information was discussed in § 12.

### § 5 General updates to version 2.0

#### BUTT END EXTRAPOLATION STRUCTURE

It is important that the type of butt end extrapolation is known. It is today possible to store definition of the butt end extrapolation method in two different ways (as is the case today), both in a table and function parameters. It was discussed whether or not to only include one method.

Present structure:



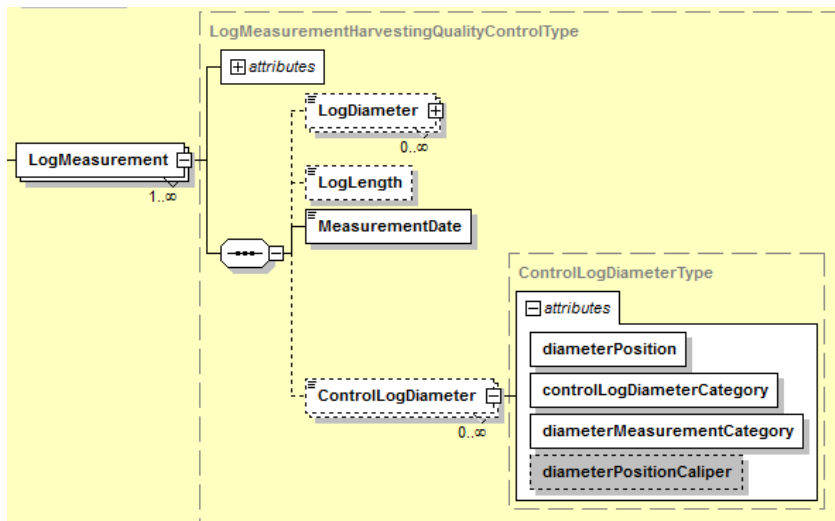
However since different manufacturers use different elements for registering and using butt end extrapolation definition it was decided not to change the structure.

It was however decided to add element ButtEndProfileExtrapolation to the hpr-message (SpeciesGroupDefinition).

## “REAL POSITION” WHERE DIAMETER WAS ACTUALLY MEASURED

It was decided to add a new optional attribute for “real position” (diameterPositionCaliper) where diameter was actually measured by operator or auditor is suggested. The existing diameterPosition includes the position used by harvester when measuring the diameter, this value must be identical for all diameters (both Machine, Operator, Auditor). The reason for adding this new attribute (diameterPositionCaliper) for measuring position is that the operator or auditor is often allowed to measure the diameter slightly below the diameterPosition if a smaller diameter value can be found below this position. This makes it possible to calculate the difference between the given position and actually used position.

New attribute diameterPositionCaliper in ControlLogDiameter structure:



## NEW SCHEMA ELEMENTS FOR DOCUMENTATION

It was decided, based on suggestion from Juha-Antti Sorsa, to add new elements for version documentation in schemas. The idea is to add documentation elements **<doc:VersionCreated>** and **<doc:VersionModified>** to the annotations for each element and attribute in schemas. These new elements would tell us the current standard version when we have defined or updated an element or attribute. Example

```

<xsd:element name="Street" type="xsd:string" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>
      <doc:Unit>free text</doc:Unit>
      <doc:Description>Street address</doc:Description>
      <doc:VersionCreated>1.0</doc:VersionCreated>
      <doc:VersionModified>2.0</doc:VersionModified>
    </xsd:documentation>
  </xsd:annotation>
</xsd:element>

```

Observe that these elements are normally not to be changed if we just re-use an old element in a new structure which will be especially common when it comes to Keys.

## MANUALLY ESTIMATED DATA

There were two suggestions concerning new elements for:

- area that is manually estimated to be left and is not harvested yet
- rate of production (manual estimation of the percentage of the production completed so far)

Both of these proposals were discussed under § 12.

## INTERRUPTIONS IN LOGGING OPERATIONS

The Finnish StanForD meeting brought up the issue of how to tell in the hpr, thp and fpr that harvesting/forwarding is interrupted for some reason.

This issue is related to the old var19 (BREAKDATE) and var20 (RESTARTDATE). A major problem is how to define a break? Maybe a new EstimatedRestartDate? This could, by default, be the next normal work date.

This issue was discussed under § 12.

## LOGGING FORM

The Finnish StanForD meeting brought up the issue of whether the change of logging form by the operator should mean that the ObjectKey / SubObjectKey are to be updated.

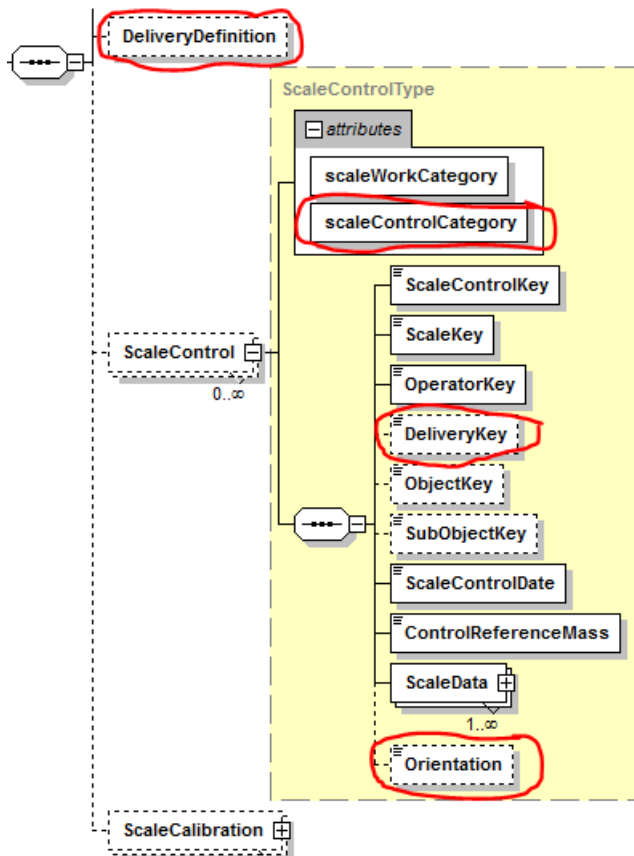
*The meeting agreed with the secretary's comment that the ObjectKey should never be updated unless a new object is to be created. The ObjectKey together with the MachineKey must be possible to use in order to get a globally unique identity for a certain harvesting object. For example, if we receive two different hpr-file from the same Object but with different ObjectKeys it will be much more difficult to make certain that this is actually the same object.*

The meeting came to the conclusion that sub objects can be used if the operator wants to use different logging forms for different parts of the object.

## INDICATION OF RANDOM SCALE CONTROL

The issue of including random control measurements of weight scales of forwarders in fqc was brought up by Ponsse. A new method for controlling weight scales in forwarders has been implemented. This new method is based on a

function where the operator is randomly told to do an extra control scaling with logs being unloaded. When this occurs the operator is supposed to hold the logs in the grapple without moving the loader (crane) in order to get a “static” measurement of the mass. It was thus decided that we add the possibility to include information about whether the subjective control is based on a reference weight with a known static mass or if it is a random control using a “static” scaling of an unknown mass.



ScaleControlCategory: “Category of of scale control, random or manual”

```
<xsd:simpleType name="ScaleControlCategoryType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Random dynamic mass"/>
    <xsd:enumeration value="Manual fixed mass"/>
  </xsd:restriction>
</xsd:simpleType>
```

ScaleControlCategory: “Element for describing on what side of the forwarder that a scale control was carried out”

```
<xsd:element name="Orientation" minOccurs="0">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="Right side of load space"/>
      <xsd:enumeration value="Left side of load space"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
```

It was also decided that the sec shall analyse the possibility to implement this data into StanForD classic prl file.

## MINOR UPDATES AFTER MEETING

The following updates were suggested after the meeting. Since no one objected it was decided with the minutes that the updates are included in the final version 2.0:

- Mandatory version attribute added into StanForD2010EnvelopeType (Mikael)
- Correct spelling from MachineIDOwner to MachineOwnerID in MachineDefinition structures (Niclas)
- Changed ForwarderData element in OtherMachineDataType from repeatable to non-repeatable (Niclas)
- Added SpeciesGroupUserID into DiameterSectionDefinitionObjectInstructionType (Jyrki Partanen, Ponsse)
- Correct ShiftDefinition and ShiftKey errors in mom (Niclas)
- SettingsKey excluded from OperatorWorkTime and FrequencyShortDownTimes in mom. Only useful in MachineWorkTime (Niclas)
- SpeciesGroupUserID excluded from ProductDefintion structure in hpr and thp sinc SpeciesGroupKey allready exists (Niclas)
- ModificationDate added per Object and per Location also in the foi message, same as in oin (John)
- Grade, ButtEndExtrapolationFunction and SoundKnotFunction added to the SpecifesGroupDefinition in the hpr, thp, hqc and mom file in the same way as in the spi-schema (John and Johan).

The following updates to the annotations were also decided with the minutes:

- "ReferenceDiameter"  
<doc:Description>Diameter at position used for predicting DBH in multi tree harvesting. Normally the first measured diameter. Not to be an extrapolated diameter (e.g. extrapolated using SPP). Can be used when calculating estimated volumes based on volume of single tree processed stems. </doc:Description>
- "diameterPosition"  
<doc:Description>Control position for diameter measuring from butt end of log. Used for log diameter vector (element ControlLogDiameter). The value must be the same for all logMeasurementcategory (Machine,

Auditor, Operator). Element is used to connect diameter values measured by Machine, Auditor and Operator. </doc:Description>

- “diameterPositionCaliper”  
<doc:Description> Real position where diameter was actually measured. This position might deviate from diameterPosition if operator or auditor measured the diameter at a different position than given by diameterPosition. To be registered in caliper for Auditor and Operator.  
</doc:Description>

## § 6 Operational monitoring

### NEW CODES FOR USED IN NORTH AMERICA

Suggestion by Marko Laine and Joonas Kaarnametsä, John Deere (2011-10-13).

The suggestions were based on requests from North America, and are related to how the work statistics registration could be improved for full tree harvesters.

### Background

Whole tree processors are sometimes used for loading trucks at road side. This means loading whole stems or long logs on to trucks with the tree processor. Loading trucks should be a new selection for manually registered work times, just like “Other work” and “Roding” are today.

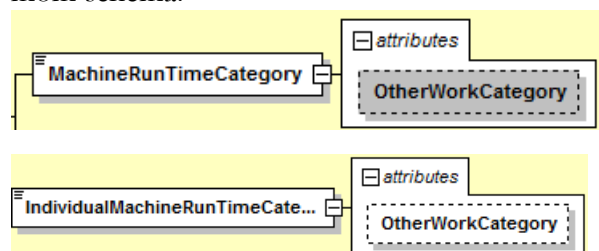
The second issue is a bit similar. There is a need for registering unnecessary driving as a manually registered down time. The difference compared to the present “Terrain travel” is that that un-productive “terrain travel” is often considered as down time in North America => suggestion for new manually down time code. Nature of the work with tracked tree processors is such that there should not be much transporting in the terrain.

### New RunTimeCategory

It was decided to add the following to variable 316t3 in the old drf-file to describe if the machine has been used for loading a truck:

- 14 = Loading trucks according to var315\_t1 (subset of Et)
- 24 = Loading trucks according to var315\_t1 (subset of E0)

It was decided to add a new attribute for specifying ”Other work”: (MachineRunTimeCategory and IndividualMachineRunTimeCategory) in the mom schema:



It was decided to update the enumeration lists according to the following:

```
<xsd:simpleType name="MachineRunTimeCategoryType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Processing"/>
    <xsd:enumeration value="Terrain travel"/>
    <xsd:enumeration value="Other work"/>
    <xsd:enumeration value="Road travel"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:attribute name="OtherWorkCategory">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="Road travel"/>
      <xsd:enumeration value="Preparing strip roads"/>
      <xsd:enumeration value="Towing other machine"/>
      <xsd:enumeration value="Roadside loading of truck"/>
      <xsd:enumeration value="Unspecified"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:attribute>
```

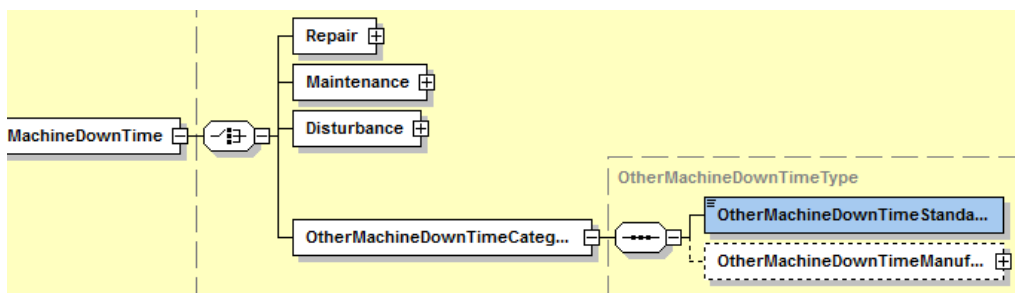
Observe that each “OtherWorkCategory” is handled as a separate times, just like for example processing and terrain travel. This means that the run time filter is supposed to be used when going from for example Road travel to Preparing of strip roads.

## New OtherMachineDownTimeStandardCode

It was decided to add the following code to variable 330t3 in the old drf-:

- DISTURBANCE, Code 7000 = Unproductive terrain work. Excessive time spent traveling from pile to pile, cribbing trail, pulling stumps, etc.

A new enumeration “Unproductive terrain work” should be added to the OtherMachineDownTimeCodeCategory in StanForD2010:



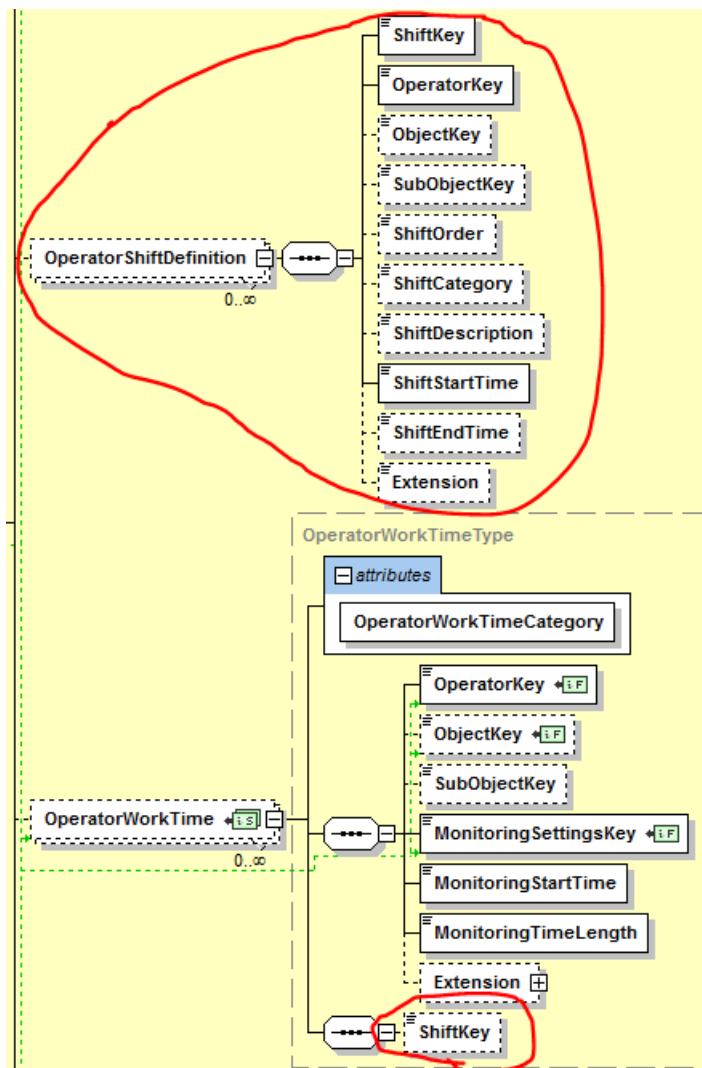
```
<xsd:simpleType name="OtherMachineDownTimeCodeCategoryType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Waiting for repair"/>
    <xsd:enumeration value="Trailer transportation"/>
    <xsd:enumeration value="Other"/>
    <xsd:enumeration value="Unproductive terrain work"/>
  </xsd:restriction>
</xsd:simpleType>
```

It was decided to clarify in the drf specification that it is allowed to “order” a manual down time by switching off the indicators. If this is not done “Unproductive terrain work” as described above would normally be registered automatically as terrain travel or processing.

This means that the basic algorithms for down times do not need to be changed, for example the rules related to the length of “FilterTimeDown”. It also means that we can select a new type of down time called “Unproductive terrain work” after the down time has lasted for more than for example 15 minutes (if we are using E15).

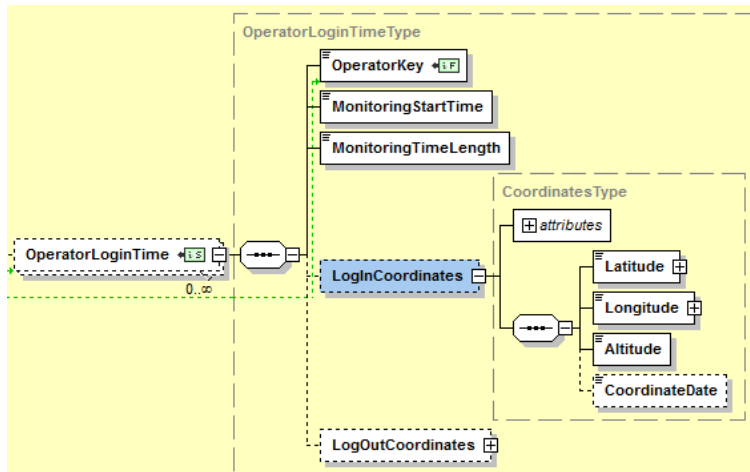
## SHIFTDEFINITION

It was decided at the previous meeting to add elements for information concerning the shift. However it was decided, based on a suggestion from the Finnish StanForD meeting, to improve this original proposal by implementing a separate ShiftDefinition in the mom file including a shift-key. The following diagrams illustrate these decisions:



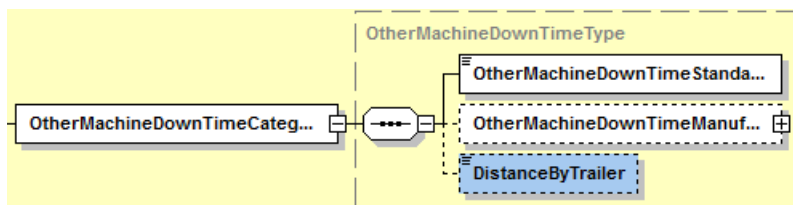
## OPERATOR LOG IN COORDINATES

It was decided, based on a suggestion from the Finnish StanForD meeting, that coordinates are added to OperatorLoginTime (coordinates of the machine at the time of log-in and log-out). This information is useful when estimating the distance between the logging site and the home base of the operators.



## TRAILER TRANSPORTATION DISTANCE

Driving distance for forest machines is included in element **DrivenDistance**. However it is not possible to register the distance driven by truck during trailer transportation of harvester or forwarder. It was suggested by the Finnish StanForD meeting that an element for distances of the machine transfers by trailer is added:



It was decided not to implement the **DistanceByTrailer**. This type of information was discussed in § 12.

## INCREASED PRIORITY TO 2 FOR VARIABLE 328 OR 329

Proposal from Jonas Gustafsson, Sveaskog. Sveaskog are developing a new “Production follow-up system” for their own logging teams. They are using the drf-file as the major data input. When working with different drf-files they have realized that is a great advantage to be able to use either var328 or var329. In order to indicate that these variables are highly useable in the old drf-file it was decided that variable 329 is given priority 2 instead of priority 3 in the drf-file. Observe that var328 is a satisfactory alternative to var329 from a Sveaskog perspective.

## § 7 Development of SilviaA for StanForD 2010

Per Knutsson informed the meeting about his work on a new SilviaA. It will be ready for testing by the end of December. The basic idea is that Silvia will create an envelope including oin, pin and spi. The need for specific new file extensions for harvester and forwarder instructions were discussed. However the meeting decided not to add any additional file extensions for different types of envelopes.

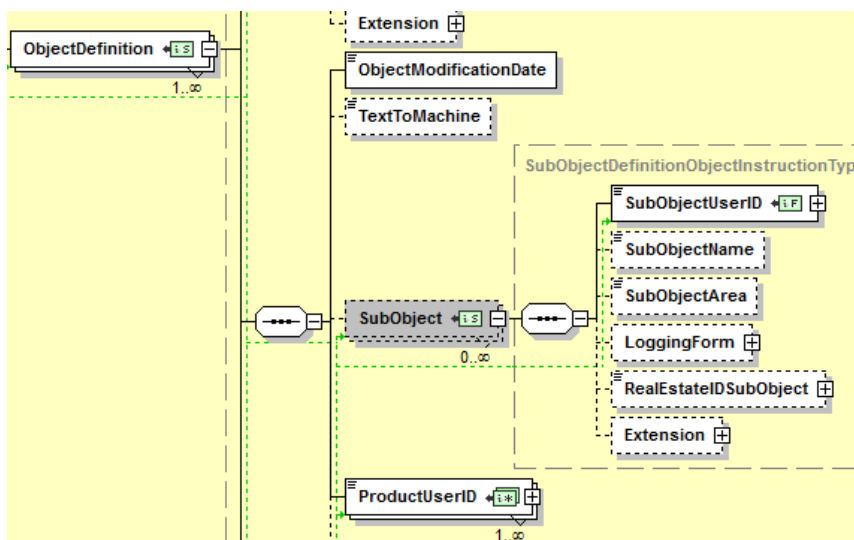
Based on some questions from Per it was decided that all UserIds and the MachineKey are to be considered “non case sensitive”. This means that for example the following ProductUserIDs are considered to be identical “PulpLogs” and “pulplogs”.

## § 8 Sub-objects and instruction

Proposal from Niclas Eriksson and Fredrik Tjernberg, Komatsu.

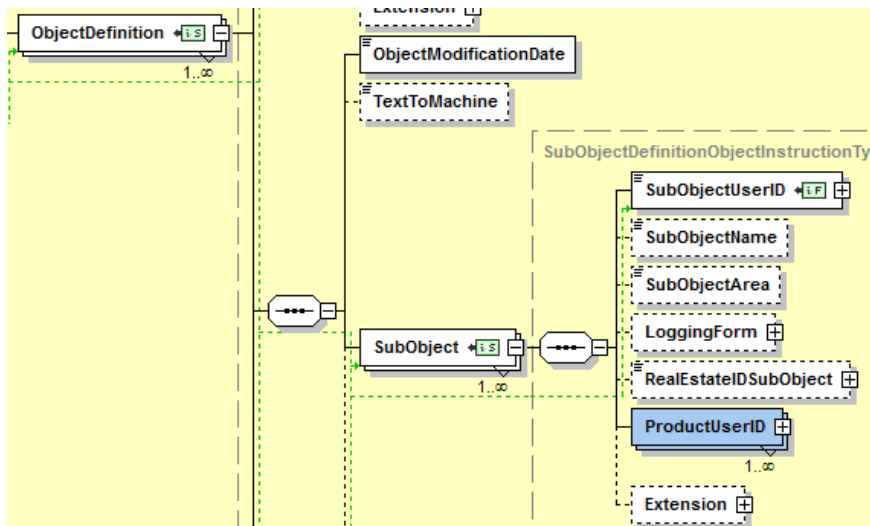
Komatsu can today use different apt-files for different sub-objects.

The problem is that they cannot use different products for different sub-objects in version 1.0 of StanForD2010. What product to be used is defined by the element ProductUserID as illustrated below:



The present model in StanForD2010 also means that you cannot define in the oin sent from a machine what products have been used for a specific sub-object. You must just include all products even if some were only used at a certain sub-object.

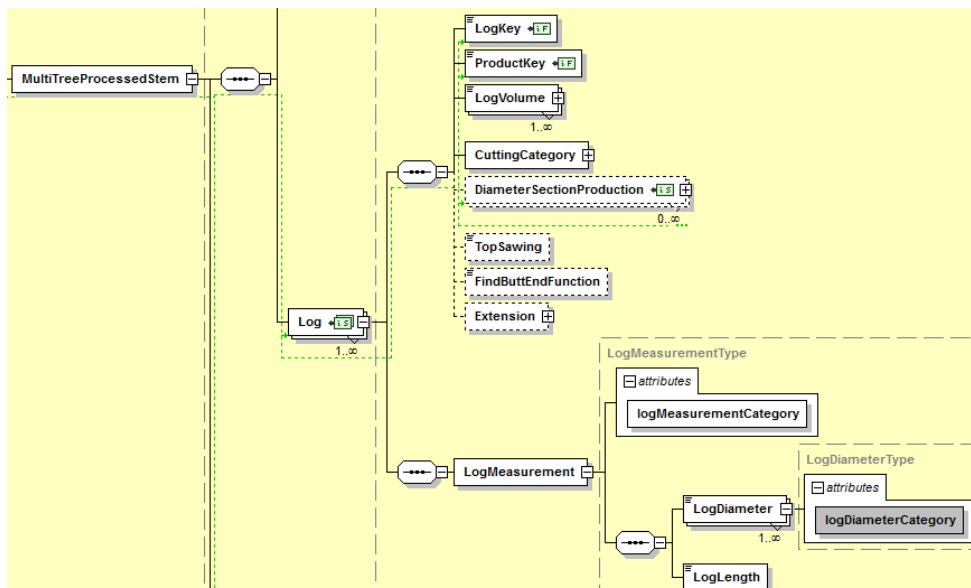
It was therefore suggested to make SubObject mandatory and move element ProductUserId in oin to the SubObject as illustrated in the diagram below:



The proposal was withdraw at the meeting since the suggested solution would be very difficult to implement for a majority of the other manufacturers.

## § 9 Multi tree harvesting and log diameters

What diameter to register for logs that that are cut during multi tree processing has not be clearly defined in version 1.0. It was therefore suggested that we add a new enumeration “Bunch top ob” to attribute logDiameterCategory. This means that we register the diameter actually measured by the harvester when cutting a bunch of logs during multi tree processing. This is the same diameter that can be registered in the pri-file.



```
<xsd:simpleType name="LogDiameterCategoryType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Top ob"/>
    <xsd:enumeration value="Top ub"/>
    <xsd:enumeration value="Mid ob"/>
  </xsd:restriction>
</xsd:simpleType>
```

```

<xsd:enumeration value="Mid ub"/>
<xsd:enumeration value="Butt ob"/>
<xsd:enumeration value="Butt ub"/>
<xsd:enumeration value="Mid HKS ob"/>
<xsd:enumeration value="Mid HKS ub"/>
<xsd:enumeration value="Bunch top"/>
<xsd:enumeration value="Bunch mid"/>
<xsd:enumeration value="Bunch butt"/>
</xsd:restriction>
</xsd:simpleType>

```

However since no one could come up with any relevant use for a “bunch diameter” it was decided to not add any new enumeration values. Observe that this means that we should register some kind of estimated diameter per individual log in the element LogDiameter (mandatory).

## § 10 Proposal new price type (ReportVolume)

Proposal from Anders Nylund, Komatsu.

For markets using top measured volumes in sawmills but only simple bucking demands (older method by choosing length in cutting tables) a new price type for value bucking in solid volume and for reporting assortment volume in top volume is necessary. In other words there is a need for being able to optimize based on solid volume but also report production based on top measured volume. This proposal is based on demands from Japanese customers but is of course usable also for other markets.

It was decided to include a new price type code for var161\_t1 for the old standard is proposed:

*Code 14. Name of category: M3tos*

*Price/m3. Volume by small end diameter (SED) according to category 1 when registering the production result. Variable 164 defines the exact position where SED is measured. Price by m3s solid volume as defined according to category 2.*

Observe that there is no need for this type of “report volume” in StanForD2010 since a top measured volume can always be calculated using log data in the hpr-file.

## § 11 Improved definitions for random sampling of control stems based on time

Two different detailed proposals from Komatsu and Ponsse were discussed. No agreement on the best alternative could be reached at the meeting. It was therefore decided to right down only the basic requirements on the sample and leave the exact details regarding the implementation to the individual manufacturers to decide.

It is suggested with the minutes that the following requirements should be followed when updating the random selection of stems based on time:

- Operator MUST never be able to predict if the next stem is to be a control stems or not.
- Control stems MUST be representative for all relevant harvested stems
- The setting in the machine MUST be so that the operator sets the average time (volume/no of stems) difference between randomly selected control stems.
- The time MUST be defined as the total logged in time for all operators. This means that we can control the outcome by dividing the number of control stems with the total time that operators have been logged into the computer. This could for example be done by analysing all hqc-files for a month and the times registered in the mom files covering the same period of time. (mom-file)
- Number of randomly selected stems MUST decrease with 50% if the operators work shorter days, e.g. 4 h instead of “normal” 8 h.
- Number of randomly selected stems MUST remain constant even if we have e.g. 50% of the trees being aspen (species not to be sampled)?
- Number of randomly selected stems MUST remain constant even if we have e.g. 33% small trees (for example DBH<18 cm, normal case in Sweden)
- Number of randomly selected stems MUST not be affected by the number of down times
- One single frequency setting for all species and operators must be used
- An individual species (SpeciesGroup) can be activated or de-activated
- It MUST NOT be possible to de-activate an individual operator
- Stems harvested at a time not included in RandomStartTime and RandomEndTime must be totally excluded.
- Sampling is based on following ”bucking software time” which means that it is activated when operator logs in bucking application and deactivated when operator logs out of bucking application.
- It is an advantage if the random sampling is balanced (not too long or too short time in between sampling), eg in order to decreased risk for auditor traveling to an “empty site” with no randomly selected stems
- It MUST be easy to set correct frequency for the auditor or operator

It was decided that this issue will be discussed at the phone meeting on the 31th of January, 2012.

## **§ 12 Diameters registered in StanForD files**

The issue of improving diameter and volume definitions was again discussed at the StanForD meetings.

It was pointed out by Mikael Eliasson that the primary objective for including a diameter vector is normally to be able to send diameter data to the calliper (control and calibration purposes). Mikael normally sends a diameter vector including increasing diameters to the calliper while he does not use increasing diameters in the optimization.

No conclusion was reached. The discussion concerning a basic framework for how to use the diameter vector will continue.

## **§ 13 New messages exchanging additional information**

### **INVOICE SPECIFICATION (APPENDIX 1)**

Tapio presented the ideas concerning an invoice specification message. The basic proposal for a new message is cancelled since these Finnish needs can be handled through the proposal concerning “User defined data”.

### **MESSAGES FOR “USER DEFINED DATA” (APPENDIX 2)**

The preliminary conclusions were that the first hand alternative will be to send out the instructions in a separate new message and send back the report from the machines using either mom, hpr or fpr. The proposal (appendix 1) should be developed in order to handle these basic alternatives concerning sending and receiving data. This issue will be discussed at the phone meeting on the 31th of January, 2012.

One issue to think about is if there is more than one instruction for example one from the contractor and one from, the forest company.

### **USING HTML5 TO INCLUDE COMPANY SPECIFIC INFORMATION**

Tapio presented the slides shown by Toumo Vourenpää in Helsinki. No new concrete examples were presented. The issue will be discussed again.

We will come back to this question regarding which are the data needs that should/could be left for HTML5 e.g. compared to User defined data –model. So the question will be to distinguish which of the user specific data needs actually are common standard issues and which not. HTML5 is a technical platform and can therefore be left outside standardization.

## **§ 14 Use of ktr, prd and apt-files by forest owner for managing wood supply chain in Germany (KWF)**

Hans-Ulrich Dietz, KWF, presented the present work done on using StanForD data more extensively in Germany.

## **§ 15 StanForD2010 v 2.0 test**

Johan J Möller presented the plans for the test that will be carried out between January and March 2012.

Before (as fast as possible) the test the manufacturer need control message (pin, oin sgi) with all functions that Skogforsk will test. Skogforsk will try to create that until beginning of December. The manufacturer also need Swedish name nomenclature for different elements to implement in there software.

## **§ 16 Information material regarding StanForD2010**

Maria Nordström presented her work on a new information brochure regarding StanForD2010. This brochure and some other information material will be published by Skogforsk in Swedish and English. All members will be free to use this material in any way they want.

## **§ 17 Discussion about updating the old standard.**

It was decided at the meeting in November 2010 that StanForD classic should be open for adjustments and updates until the autumn 2011. The issue of whether or not to stop updating the old standard will be discussed at the next meeting.

It was decided to allow minor updates in StanForD classic for at least one more year.

## **§ 18 Other issues**

### **HPR-ANALYSIS**

Nazmul presented his work on a software for analysing hpr-messages.

### **UPDATING ROOT ATTRIBUTES**

There are some common attributes in the root element of each message:

- messageType, areUnit, diameterUnit, lengthUnit, volumeUnit, weightUnit, version

These attributes were originally grouped together into attributeGroup structure of the schema that was located in StanForD2010CommonDefinitions schema module

It's easy add new common attributes in one place if all message specific schemas reference to that same attribute group in their own definitions of the root element

However when we decided that messageType attribute should always have fixed value that defines what message it is, we lost this benefit. For example messageType attribute of the hpr message has always fixed value "hpr".

After that decision we copied and took away attributeGroup definition from the StanForD2010CommonDefinitions and put it into each message specific schema module because now they were all different, everyone has different fixed value in messageType attribute.

However last evening a person from the software development unit of the John Deere contact me (JAS) and present some software development problems related to these message specific attribute group definitions. After few emails and tests with XML Spy we agreed that we should move the definition of those common

attributes back into StanForD2010CommonDefinitions module but leave out the messageType and declare that attribute in every message specific schema

Benefits:

- All common attributes are again defined only one place and if there are needs to update those attributes it can be done in one place
- This change help us to generate code from the schemas
- 

The present structure (in hpr message):

```
<xsd:complexType name="HarvestedProductionType">
  <xsd:sequence>
    ...
  </xsd:sequence>
  <xsd:attributeGroup ref="MessageAttributeGroupHarvestedProduction"/>
</xsd:complexType>
...
<xsd:attributeGroup name="MessageAttributeGroupHarvestedProduction">
  <xsd:attribute name="messageType" type="MessageCategoryType" use="required" fixed="hpr"/>
  <xsd:attribute name="areaUnit" type="AreaUnitType" use="required"/>
  <xsd:attribute name="diameterUnit" type="DiameterUnitType" use="required"/>
  <xsd:attribute name="lengthUnit" type="LengthUnitType" use="required"/>
  <xsd:attribute name="volumeUnit" type="VolumeUnitType" use="required"/>
  <xsd:attribute name="weightUnit" type="WeightUnitType" use="required"/>
  <xsd:attribute name="version" type="StanForD2010VersionType" use="required"/>
</xsd:attributeGroup>
```

The meeting decided to change it to the follwing structures. In hpr message:

```
<xsd:complexType name="HarvestedProductionType">
  <xsd:sequence>
    ...
  </xsd:sequence>
  <xsd:attribute name="messageType" type="MessageCategoryType" use="required" fixed="hpr"/>
  <xsd:attributeGroup ref="MessageAttributeGroup"/>
</xsd:complexType>
```

In StanForD2010CommonDefinitions module:

```
<xsd:attributeGroup name="MessageAttributeGroup">
  <xsd:attribute name="areaUnit" type="AreaUnitType" use="required"/>
  <xsd:attribute name="diameterUnit" type="DiameterUnitType" use="required"/>
  <xsd:attribute name="lengthUnit" type="LengthUnitType" use="required"/>
  <xsd:attribute name="volumeUnit" type="VolumeUnitType" use="required"/>
  <xsd:attribute name="weightUnit" type="WeightUnitType" use="required"/>
  <xsd:attribute name="version" type="StanForD2010VersionType" use="required"/>
</xsd:attributeGroup>
```

Observe that this change contribute only to the way we organize our schema definitions. The information content and structure of the messages do not change

## **MACHINE KEY**

Teemu Paldanius raised the question of how to use MachineKey. John recommended a GUID (global unique identity) which for example can be created with a Windows API. It is very important not to reuse the machine key when replacing the computer if the previously used Keys are not know (e.g. ObjectKey, StemKey, ProductKey). Manufacturer information like model, serial number etc may be added to the MachineKey or to a manufacturer specific extension.

## **§ 19 Next meetings**

2012-01-31 phone meeting at 09:00 CET

2012-04-18--19 meeting in Uppsala (19th is a reserve day)

## **§ 20 End of meeting**

Johan thanked everyone for their participation.

Tapio Räsänen

November 3, 2011

## Invoice Specification (isp)

Proposal for a new message in StanForD 2010 version 2.0

*Updated from the version 2011-09-13.*

### Background

Contractors' Association in Finland has started a project in order to develop IT applications for logging contractors. The goal is to create software for management of salary payments and compensations regarding machine operators and other workers, operation and production follow-up of forest machines and invoicing of extra work that is done related to logging and silviculture operations. The development of the applications will be based on StanForD 2010.

Working group of Contractors' Association had a joint meeting with machine manufacturers (John Deere, Ponsse and Komatsu), Tietohippu Oy (IT provider in the project) and Metsäteho on 2011-06-01. Data transfer needs of the contractors were discussed in the meeting and some suggestions for changes in StanForD 2010 were raised. Decision of the meeting was that a new message is proposed to StanForD 2010 for sending invoice specification information from a forest machine to various purposes.

The proposal for a new Invoice Specification (isp) message was first time presented at the phone meeting of StanForD 2010 working group on 2011-06-22. After the meeting the issue has been discussed further at a meeting between Metsäteho and Skogforsk in August 2011. It has been noticed that the contractors in Sweden may have similar kind of data needs, although they are not specified so far.

*Preliminary version of a new StanForD 2010 message Invoice Specification (isp) was prepared for StanForD 2010 meeting on 13<sup>th</sup> September. In the discussion it was noted that one problematic issue with the message is how to define the types of extra work and the invoiced material in a standardised way so that the solution is global and suitable enough for all the users and markets. After the meeting Komatsu has made a proposal how user defined data could be handled in StanForD 2010.*

*Another meeting with Working group of Contractors' Association was held on 17<sup>th</sup> of October. Isp message and its schema were presented and discussed.*

*Some changes to the data definitions were made which are described later in this document.*

*It is suggested that question of defining isp and including it to version 2.0 is handled together with the question of user defined data in StanForD meeting on November 8-9. It may be reasonable not to specify at all a separate message for invoicing purposes if it is possible to find a new flexible solution for both sending instructions and reporting user defined data from the machines. **Therefore isp schema is not updated before the meeting.***

## **Needs for sending invoice specification information**

Contractors have a need to send invoices to their customers in certain cases depending on the business case and the services provided. In Finland regular harvesting work is normally paid by the forest companies based on the harvested volumes. In other words the contractors don't invoice their customers for their main work. However, there is already today an increasing amount of extra work that is directly linked to the daily main work or done only occasionally. This extra work must be invoiced by the contractor himself, because self-billing is not possible due to lack of information by the customer. In a wood supply environment the potential parties to be invoiced are forest companies, Forestry Associations, private forest owners and other contractors.

Today data management of the forest machines does not support well enough registering the information that is needed for preparing the invoice of the extra work. Usually the forest machine operator is the only person who knows and can register the invoicing basics. There are no means to do it fluently and different methods are used: phone, e-mail, text messages, paper notes etc. Actual invoicing is then done by office staff or bookkeeper of the contractor based on the received information. In worst cases the information must be once again checked.

## **Use of Invoice Specification**

Idea with Invoice Specification message is that all the information is filled in by the operator in the machine and basically no production and time data is gathered from the measuring system. There could be a separate worksheet in the machine application for doing this. Data to be registered is partly free-form (text), but also some pre-defined standardized codes (e.g. extra work categories and consumed materials) should be able to be used. Contractors' Association has defined a list of work categories, invoicing basics and invoicing units, which has been used in preparing the isp schema.

To keep isp clear enough for the users and developers as well, there should be as little mixing of data with other StanForD 2010 messages as possible (e.g. no production data from hpr). However, for identifying purposes, some machine, operator and object data is needed. In the application there could be also some assist provided from the machine's work time registration system (operators' work time). On the other hand isp data is not to be included in any other StanForD 2010 message (hpr, fpr or mom) to keep them clear enough.

Use cases of isp are

1. Extra work to be invoiced
2. Consumed materials to be invoiced
3. [Sending basics for the changes of harvesting and forwarding work prices \(changes to base tariffs\)](#)

Combination of all these is also possible. Invoice Specification message is sent from the machine to the contractor or in case of self-billing to the forest company or other customer.

### Data structure of Invoice Specification

Data elements to be included in isp are:

<InvoiceSpecificationHeader>

<Machine>

- all the present or only selected elements from Machine?
- for identification mainly

<OperatorDefinition>

- mandatory elements only?

<ObjectDefinition>

- selected data elements from Object including SubObject for identification ?

**<InvoiceSpecificationDefinition>** *new, specific to isp only*

- The structure is defined to support all of the isp use cases
  - extra work to be invoiced
  - consumed materials to be invoiced
  - [sending basics for the changes of harvesting and forwarding work prices](#)
- No prices of work or material to be sent, except if there is a specific reason for that
  - e.g. fixed price per work event and the deal is done in the forest
- extra work event as a registering level

- there can be several work events in one message (as well as materials and [price change](#) information)

#### <InvoicedParty>

- *there might be cases in which this is to be sent from the machine*
- elements of ContactInformation

#### <ExtraWorkEvent>

- extra work category (standardized code)
- invoicing base
  - invoicing base type/class (standardized code)
  - invoicing base description (free text)
- quantity
- unit of quantity (standardized code)
- extra work event description (free text)
- <ObjectKey>
  - [Extra work event is registered for one object only. If there are several objects involved, then there should be as many <ExtraWorkEvent> elements saved.](#)
  - Should object be mandatory? There might be invoicing cases in which the work does not belong to any harvesting object or belongs to many.
- <OperatorKey>
  - several operators possible to be informed or only one who is preparing and sending the message?

#### <InvoicedMaterial>

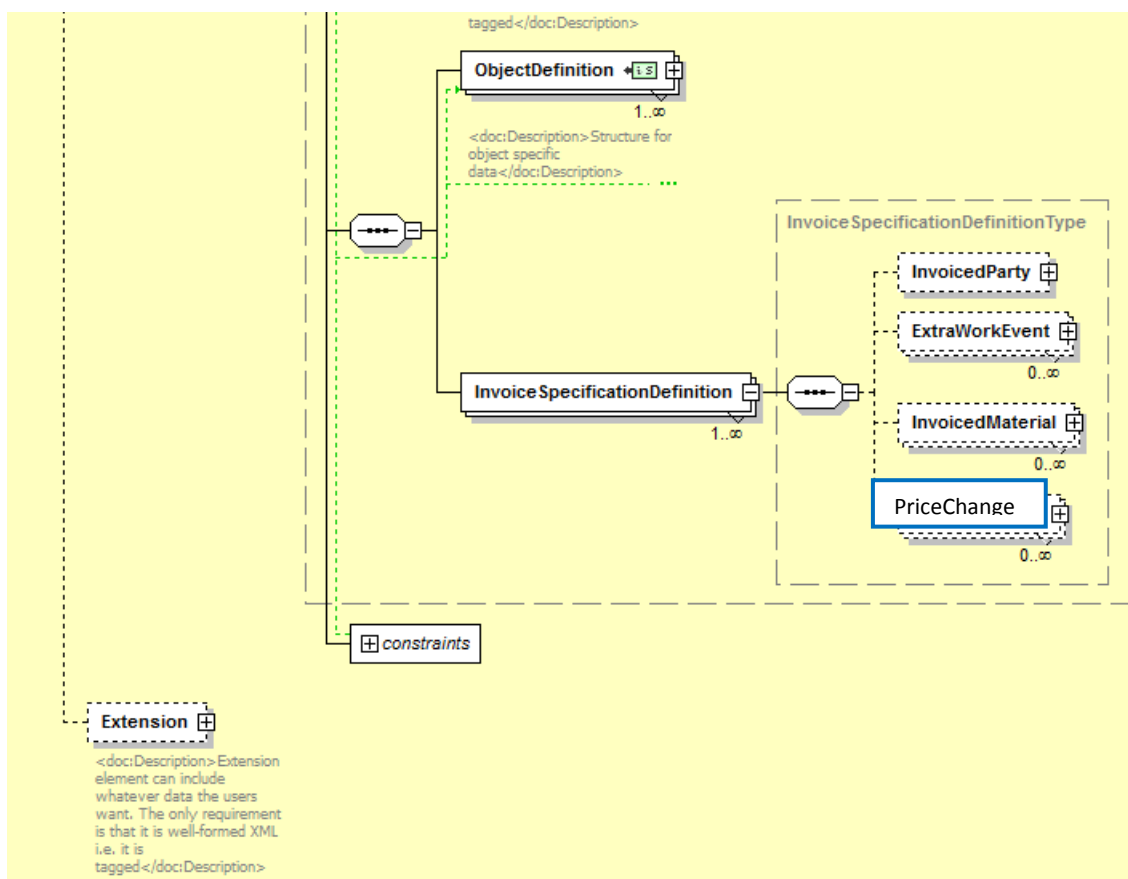
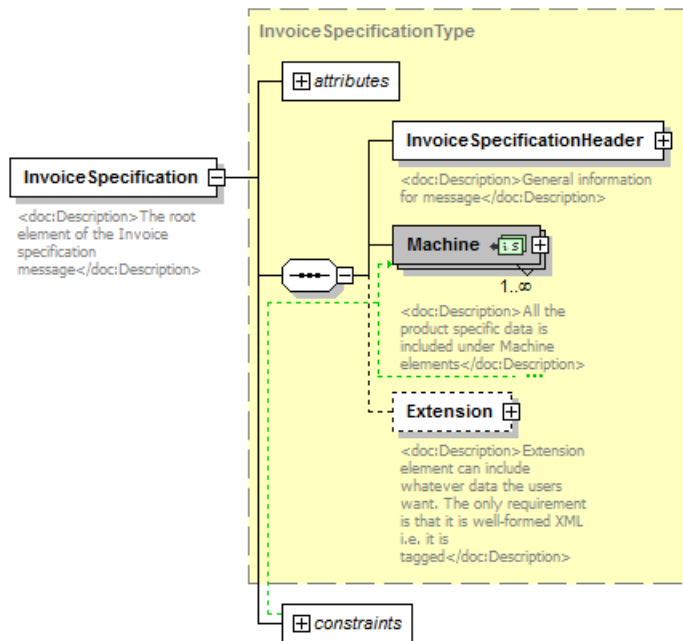
- material consumed and to be invoiced
- material category (standardized code)
- quantity (standardized code)
- unit of quantity (standardized code)
- material description (free text)
- <ObjectKey>
  - [Invoiced material is registered for one object only. If there are several objects involved, then there should be as many <InvoicedMaterial> elements saved.](#)
  - mandatory?
- <OperatorKey>
  - several operators possible to be informed or only one who is preparing and sending the message?

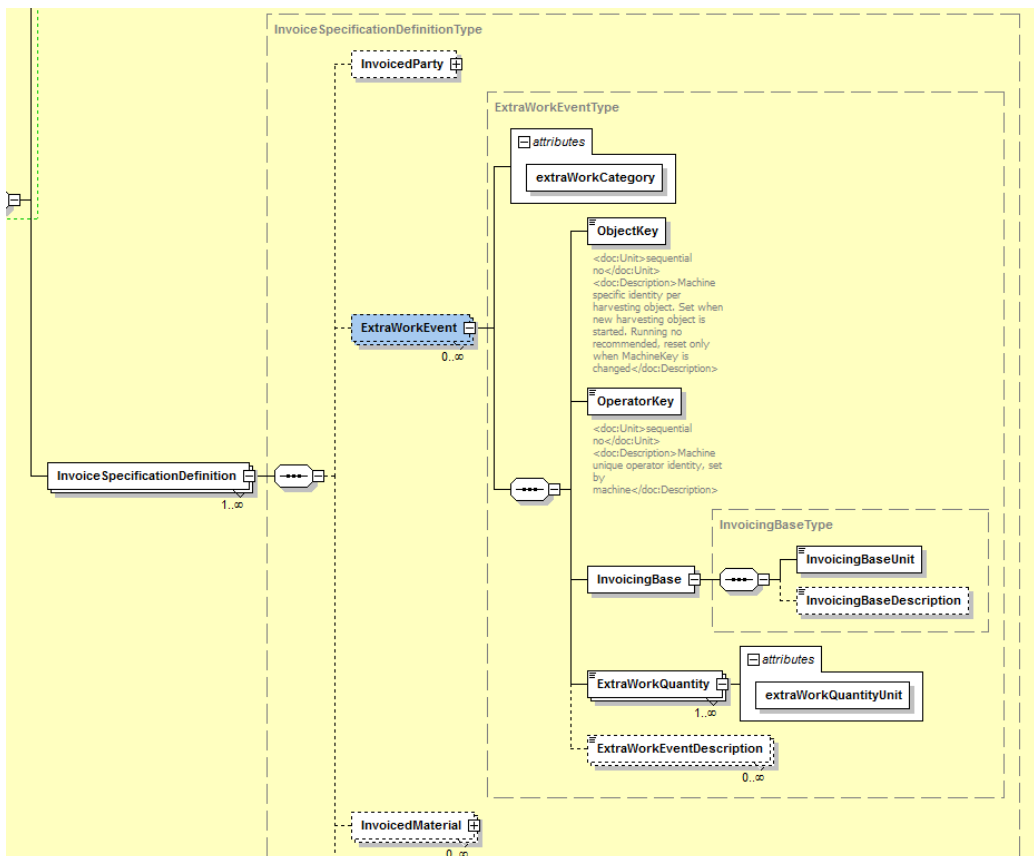
#### <PriceChange>

- [Basics for the possible change of harvesting or forwarding work prices. There might be changes in the work conditions](#)

that can either raise or decrease the work price. Change of logging form is a typical case. Another example: additional payment for harvesting on peatland is used in cases when special equipment is needed in the machines. The payment can be e.g. a supplement in logging price, €/m<sup>3</sup>. The harvested volume is the invoicing base and quantity of volume is informed.

- price change reason (standardized code, element or attribute?)
- quantity
- unit of quantity (standardized code)
- <ObjectKey>
  - only one object per <PriceChange>
- <OperatorKey>
  - several operators possible to be informed or only one who is preparing and sending the message ?





Enumerations of attribute extraWorkCategory (given by Contractors' Association, some enumerations added)

- Harvesting (normal harvesting)
- SpecialHarvesting
- ManualHarvesting
- Forwarding (normal forwarding)
- ExtendedForwarding
- SpecialForwarding
- SitePreparation should this be divided according to method?
- MachinePlanting
- YoungStandTreatment pre-commercial harvesting with machines
- StandInventory (incl. updating stand data and manual stand measurements)
- UndergrowthCleaning
- StumpTreatment
- ProcessingOfLoggingResidues
- CoveringOfEnergyWood
- MachineTransfer
- RoadMaintenance
- ControlMeasurement
- WorkSitePlanning
- ControlOfWorkQuality
- OtherMachineWork
- OtherManualWork

Enumerations of attribute invoicingBase

- MachineWork
- ManualWork
- Area
- Volume
- Weight
- Distance
- Number
- Price
- PriceCoefficient (percentage of base tariff)
- Other

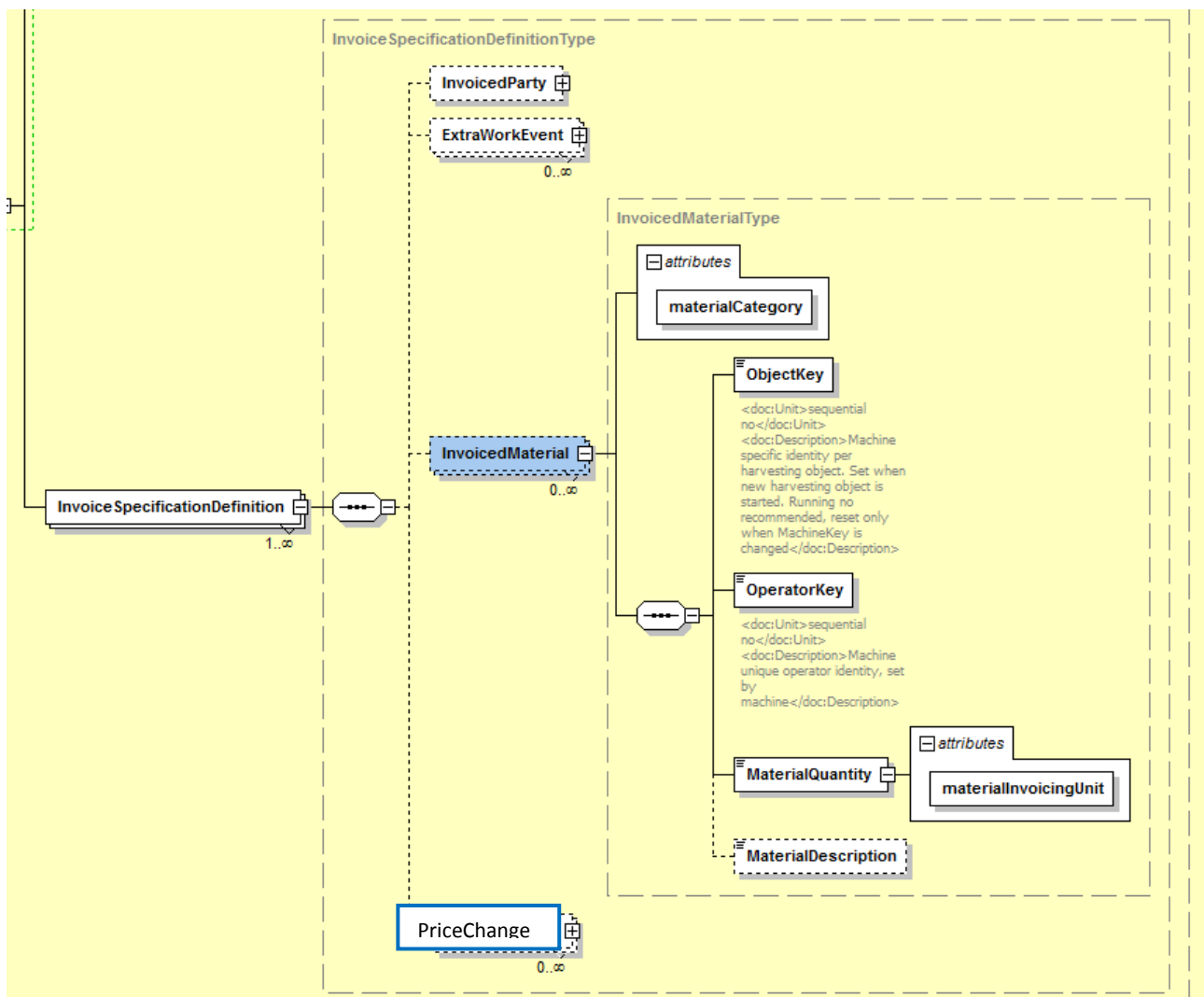
Enumerations of attribute extraWorkQuantityUnit

- Hour
- Hectare
- CubicMeter
- Kilogram
- Ton
- Meter
- Kilometer
- Number
- LocalCurrency
- Percent
- Other

Example

| Invoice-Specification-Definition | Extra-Work-Event | extraWork-Category            | invoicing Base-Category | ExtraWork-Quantity | extraWork-QuantityUnit | Object Key | Operator-Key | ExtraWorkEvent Description        |
|----------------------------------|------------------|-------------------------------|-------------------------|--------------------|------------------------|------------|--------------|-----------------------------------|
| 1                                | 1                | Undergrowth-Cleaning          | Manual-Work             | 5                  | Hour                   | 12345      | 2            |                                   |
| 2                                | 1                | Undergrowth-Cleaning          | Machine-Work            | 2,7                | Hectare                | 12346      | 2            |                                   |
| 3                                | 1                | Special-Harvesting            | Machine-Work            | 2,5                | Hour                   | 12347      | 1            | Logging demonstration 2011-09-13. |
| 4                                | 1                | ProcessingOf Logging-Residues | Volume                  | 224                | CubicMeter             | 12348      | 1            |                                   |
| 4                                | 2                | ProcessingOf Logging-Residues | Volume                  | 133                | CubicMeter             | 12348      | 2            |                                   |

|   |   |                               |              |     |            |       |   |                       |
|---|---|-------------------------------|--------------|-----|------------|-------|---|-----------------------|
| 4 | 3 | ProcessingOf Logging-Residues | Volume       | 369 | CubicMeter | 12349 | 2 |                       |
| 5 | 1 | RoadMaintenance               | Distance     | 500 | Meter      | 12350 | 1 | Snowploughing, week 4 |
| 6 | 1 | OtherMachine Work             | Machine Work | 8   | Hour       | 12351 | 1 | StanForD 2010 testing |
| 6 | 2 | OtherManual Work              | ManualW ork  | 8   | Hour       | 12351 | 1 | StanForD 2010 testing |



### Enumerations of attribute materialCategory

- StumpTreatmentLiquid
- CoveringMaterial
- Fuel
- HydraulicOil
- Other

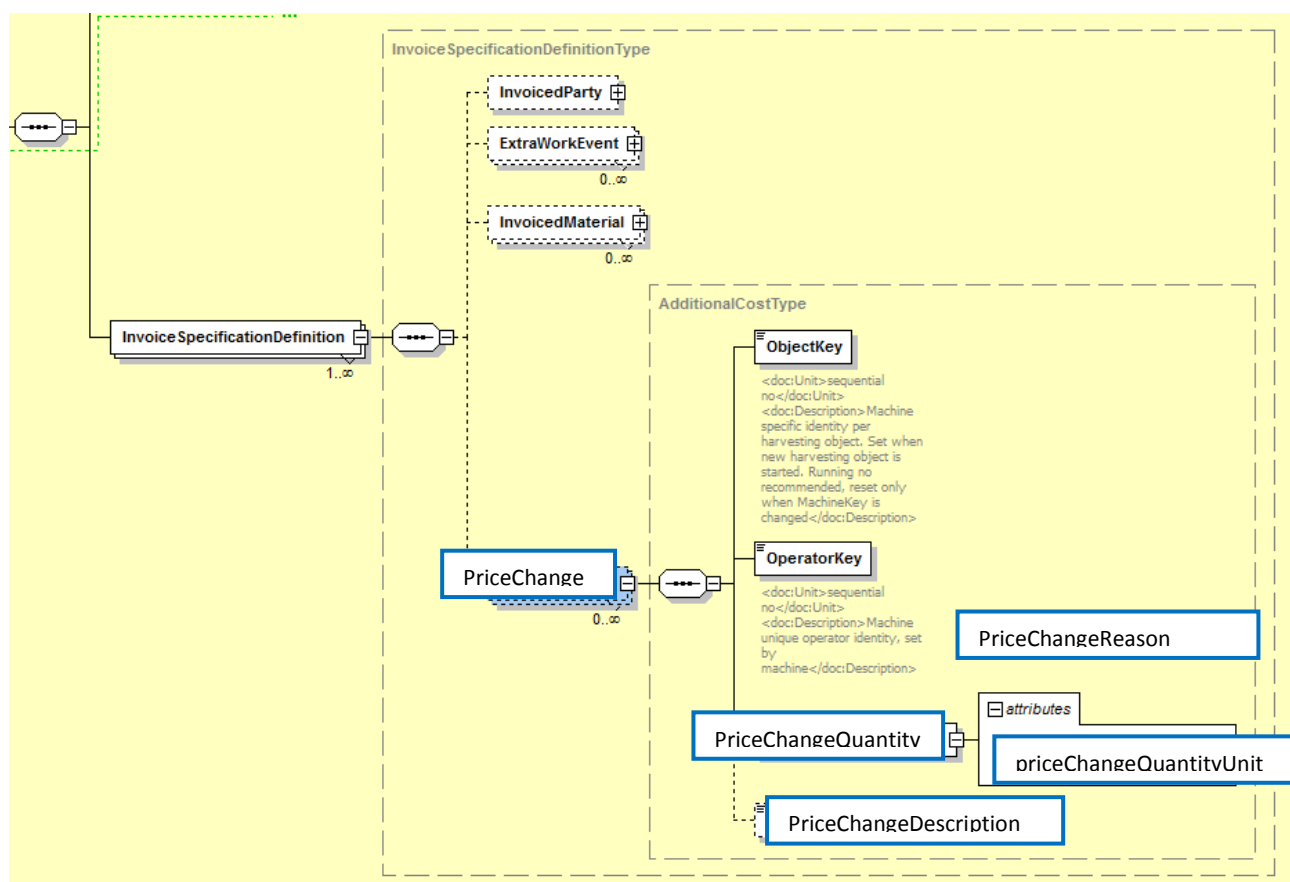
Enumerations of attribute materialInvoicingUnit

- Litre
- Gram
- Kilogram
- Ton
- Meter
- SquareMeter
- Number
- LocalCurrency
- Other

e.g. number of bioenergy cover rolls

Example

| Invoice-Specification Definition | Invoiced-Material | materialCategory     | Material-Quantity | material-Invoicing-Unit | Object-Key | Operator-Key | Material-Description                                                                                                         |
|----------------------------------|-------------------|----------------------|-------------------|-------------------------|------------|--------------|------------------------------------------------------------------------------------------------------------------------------|
| 7                                | 1                 | StumpTreatmentLiquid | 30                | Litre                   | 12351      | 1            |                                                                                                                              |
| 7                                | 2                 | StumpTreatmentLiquid | 40                | Litre                   | 12351      | 2            |                                                                                                                              |
| 7                                | 3                 | StumpTreatmentLiquid | 50                | Litre                   | 12352      | 1            |                                                                                                                              |
| 7                                | 4                 | StumpTreatmentLiquid | 60                | Litre                   | 12353      | 2            | 40 litres liquid A<br>20 litres liquid B                                                                                     |
| 8                                | 1                 | Other                | 75,80             | Local-Currency          | 12347      | 1            | Beer, sausages, coffee. Logging demonstration 2011-09-13. I will bring the receipt next time when I will come to the office. |



### Enumerations of element or attribute PriceChangeReason

- ChangeOfLoggingForm                      change from the pre-defined form
- LoggingOfWindfalls
- SpecialLogging                              e.g. loggings on constructed land
- ImprovementOfBearingCapacity
- Other

### Enumerations of attribute priceChangeQuantityUnit

- CubicMeter
- Ton
- LocalCurrency

### Example

| Invoice-Specification-Definition | Price-Change | Price-Change-Quantity | priceChange-QuantityUnit | ObjectKey | OperatorKey | PriceChange-Description                                |
|----------------------------------|--------------|-----------------------|--------------------------|-----------|-------------|--------------------------------------------------------|
| 9                                | 1            | 770                   | Ton                      | 12354     | 1           | Additional price for having extra rollers on forwarder |





John Arlinger

5 October 2011

## User defined data within StanForD2010

### Background

The proposals in this document are based on suggestions from Peter Assarsson, Komatsu. If this proposal is deemed to be interesting and relevant at the next meeting the idea is to prepare a draft version that can be tested by one or several manufacturers until the next meeting.

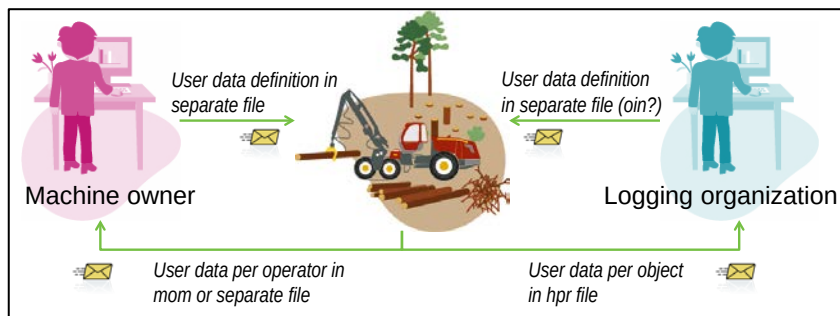
A new message called invoice specification used for registering extra work and material has been discussed. The main objective of this message is to make it possible to register events inside or outside forest machines that are to be included when machine owner is invoicing logging organization. Today this is often solved either by having the operator writing on a piece of paper or in an excel-sheet. A large number of other examples where excel-sheets are used for registering relevant information in forest machines could probably be found out in the “real world”.

A problem with standardizing this type of information is that the needs probably vary significantly between different organizations and markets. An example might be trying to compile a list of different work categories. Below follows a possible list of such extra work categories:

|                     |                             |
|---------------------|-----------------------------|
| Harvesting          | StumpTreatment              |
| SpecialHarvesting   | ProcessingOfLoggingResidues |
| ManualHarvesting    | CoveringOfEnergyWood        |
| Forwarding          | MachineTransfer             |
| ExtendedForwarding  | RoadMaintenance             |
| SpecialForwarding   | ControlMeasurement          |
| SitePreparation     | WorkSitePlanning            |
| MachinePlanting     | ControlOfWorkQuality        |
| YoungStandTreatment | OtherMachineWork            |
| StandInventory      | OtherManualWork             |
| UndergrowthCleaning |                             |

It would be an advantage if we could find a flexible solution for both sending instructions and reporting user defined data from forest machines.

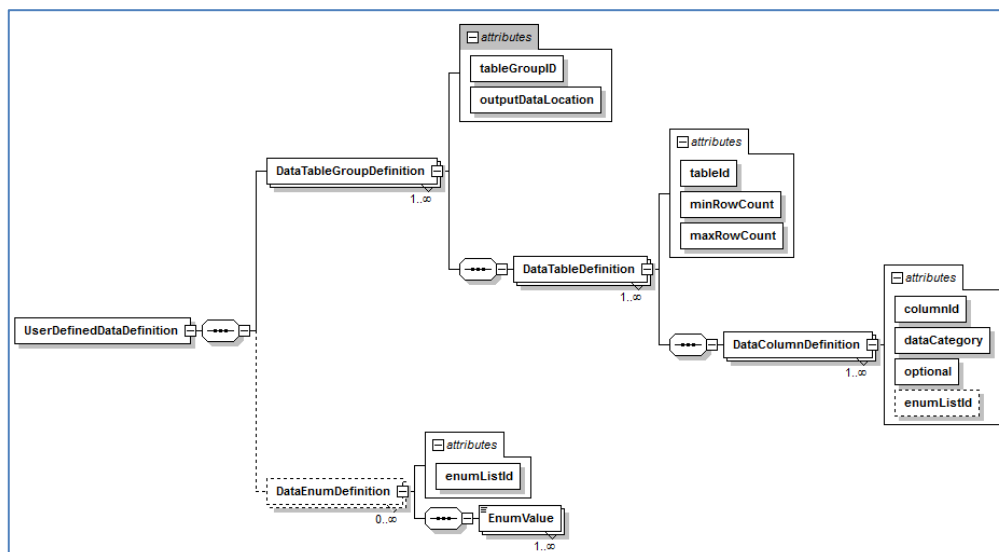
The figure below illustrates a possible solution for how instructions could be sent to a machine from either forest machine owner or logging organization and then returned together within a StanForD message or as totally separate message.



The basic idea is to make it possible to define tables that the operator can use in the machine to manually register data relevant for logging organization or machine owner.

## Input / Instruction

Below is a schema example describing what the structure of an instruction might look like:



### DataTableGroupDefinition.

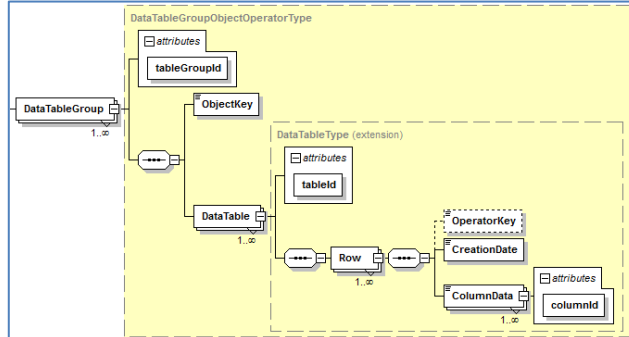
This structure is comparable with a database or an "excel work book" to be reported in a single way.

DataTableGroupDefinition is repeatable. If for example the machine owner needs information from the "Down time" and information specific for the harvesting object. This requires that there are possibilities to add many DataTableGroupDefinitions. The idea is that for every DataTableGroupDefinition there will be a new "tab" in the dialog.

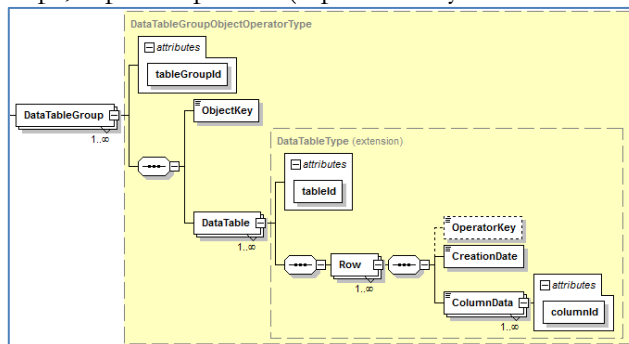
### outputDataLocation

Attribute **outputDataLocation** points to where the user defined data should be registered and then reported. The following enumerations are suggested:

- *Object-ProductionFile*, information is stored per object in hpr, thp and fpr files (OperatorKey in illustration below is not used).



- *Object-MonitoringFile*, information is stored per object in mom files.
- *ObjectOperator-ProductionFile*, information is stored per operator and object in hpr, thp and fpr files (OperatorKey in illustration below is used).



- *ObjectOperator-MonitoringFile*, information is stored per operator and object in mom files.
- *ObjectOperator-UserDefinedFile*, information is stored per operator and object new file for user defined data (specific schema needed).
- *Shift-MonitoringTime*, information is stored per shift in mom files.  
**ShiftKey needed, discussed with Komatsu?**
- *DownTime-MonitoringFile*, information is stored per down time in mom files. **Hmm, do we need a new DownTimeKey????**

### DataTableDefinition.

This structure is comparable with a database table or an “excel work sheet”.

Attributes for DataTableDefinition:

- maxRowCount=”1” or “maxint”
- minRowCount=”0” or “1”

## DataColumnDefinition

This structure is comparable with fields in a database table or columns in an “excel-sheet”.

Attributes for DataColumnDefinition:

- dataCategory (mandatory) = “enum”, “string”, “integer” or “decimal”
- optional (mandatory) = “false” or “true”
- enumListId (optional) = for example “UnitList”, refers to a DataEnumDefinition (see also next section)

## DataEnumDefinition

This structure includes enumeration lists to be used in the machine. Attribute enumListId identifies the enumeration list to be used

## XML example

Example of xml-file with instruction for how to report user defined data:

```
<UserDefinedDataDefinition xsi:schemaLocation="urn:skogforsk:stanford2010:1:release UserDefinedDataInstruction_v2.xsd"
xmlns="urn:skogforsk:stanford2010:1:release" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <DataTableGroupDefinition outputDataLocation="ObjectOperator-UserDefinedFile" tableGroupID="InvoiceSpecification">
    <DataTableDefinition tableId="InvoicedParty" maxRowCount="1" minRowCount="1">
      <DataColumnDefinition columnName="CustomerId" dataCategory="integer" optional="false"></DataColumnDefinition>
      <DataColumnDefinition columnName="Name" dataCategory="integer" optional="true"></DataColumnDefinition>
    </DataTableDefinition>
    <DataTableDefinition tableId="ExtraWorkEvent" maxRowCount="maxint" minRowCount="0">
      <DataColumnDefinition columnName="ExtraWorkCategory" dataCategory="enum" optional="false"
        enumListId="ExtraWorkCategoryList"></DataColumnDefinition>
      <DataColumnDefinition columnName="BasicsForInvoicingTheWork" dataCategory="enum" optional="false"
        enumListId="BasicsForInvoicingTheWorkList"></DataColumnDefinition>
      <DataColumnDefinition columnName="Quantity" dataCategory="integer" optional="false"></DataColumnDefinition>
      <DataColumnDefinition columnName="Unit" dataCategory="enum" optional="false" enumListId="UnitList"></DataColumnDefinition>
      <DataColumnDefinition columnName="Comment" dataCategory="string" optional="true"></DataColumnDefinition>
    </DataTableDefinition>
    <DataTableDefinition tableId="InvoicedMaterial" maxRowCount="maxint" minRowCount="0">
      <DataColumnDefinition columnName="Type" dataCategory="enum" optional="false"
        enumListId="ExtraWorkCategoryList"></DataColumnDefinition>
      <DataColumnDefinition columnName="Quantity" dataCategory="integer" optional="false"></DataColumnDefinition>
      <DataColumnDefinition columnName="Unit" dataCategory="enum" optional="false" enumListId="UnitList"></DataColumnDefinition>
      <DataColumnDefinition columnName="Comment" dataCategory="string" optional="true"></DataColumnDefinition>
    </DataTableDefinition>
  </DataTableGroupDefinition>

  <DataEnumDefinition enumListId="ExtraWorkCategoryList">
    <EnumValue>Harvesting (normal harvesting)</EnumValue>
    <EnumValue>SpecialHarvesting</EnumValue>
    <EnumValue>ManualHarvesting</EnumValue>
    <EnumValue>Forwarding (normal forwarding)</EnumValue>
    <EnumValue>ExtendedForwarding</EnumValue>
    <EnumValue>SpecialForwarding</EnumValue>
    <EnumValue>SitePreparation, divided according to method</EnumValue>
    <EnumValue>MachinePlanting</EnumValue>
    <EnumValue>YoungStandTreatment pre-commercial thinning </EnumValue>
    <EnumValue>StandInventory (manual measurements)</EnumValue>
    <EnumValue>UndergrowthCleaning</EnumValue>
    <EnumValue>StumpTreatment</EnumValue>
    <EnumValue>ProcessingOfLoggingResidues</EnumValue>
    <EnumValue>CoveringOfEnergyWood</EnumValue>
    <EnumValue>MachineTransfer</EnumValue>
    <EnumValue>RoadMaintenance</EnumValue>
    <EnumValue>ControlMeasurement</EnumValue>
    <EnumValue>WorkSitePlanning</EnumValue>
    <EnumValue>ControlOfWorkQuality</EnumValue>
  </DataEnumDefinition>
</UserDefinedDataDefinition>
```

```

      <EnumValue>OtherMachineWork</EnumValue>
      <EnumValue>OtherManualWork</EnumValue>
    </DataEnumDefinition>

    <DataEnumDefinition enumListId =" BasicsForInvoicingTheWorkList">
      <EnumValue>Ordered by logging company</EnumValue>
      <EnumValue>Ordered by forest owner</EnumValue>
    </DataEnumDefinition>

    <DataEnumDefinition enumListId ="UnitList">
      <EnumValue>Euro</EnumValue>
      <EnumValue>Kg</EnumValue>
      <EnumValue>Litre</EnumValue>
      <EnumValue>m3</EnumValue>
      <EnumValue>ha</EnumValue>
      <EnumValue>hour</EnumValue>
    </DataEnumDefinition>

  </UserDefinedDataDefinition>

```

## User interface example

The instruction described above could render the following GUI.

First table:

| InvoiceSpecification |                |                  |
|----------------------|----------------|------------------|
| InvoicedParty        | ExtraWorkEvent | InvoicedMaterial |
| OperatorKey / Date   | CustomerId     | Name             |
|                      |                |                  |

Second table:

| InvoiceSpecification |                   |                           |          |      |         |
|----------------------|-------------------|---------------------------|----------|------|---------|
| InvoicedParty        | ExtraWorkEvent    | InvoicedMaterial          |          |      |         |
| OperatorKey / Date   | ExtraWorkCategory | BasicsForInvoicingTheWork | Quantity | Unit | Comment |
|                      |                   |                           |          |      |         |

Third table:

| InvoiceSpecification |                |                  |      |         |
|----------------------|----------------|------------------|------|---------|
| InvoicedParty        | ExtraWorkEvent | InvoicedMaterial |      |         |
| OperatorKey / Date   | Type           | Quantity         | Unit | Comment |
|                      |                |                  |      |         |

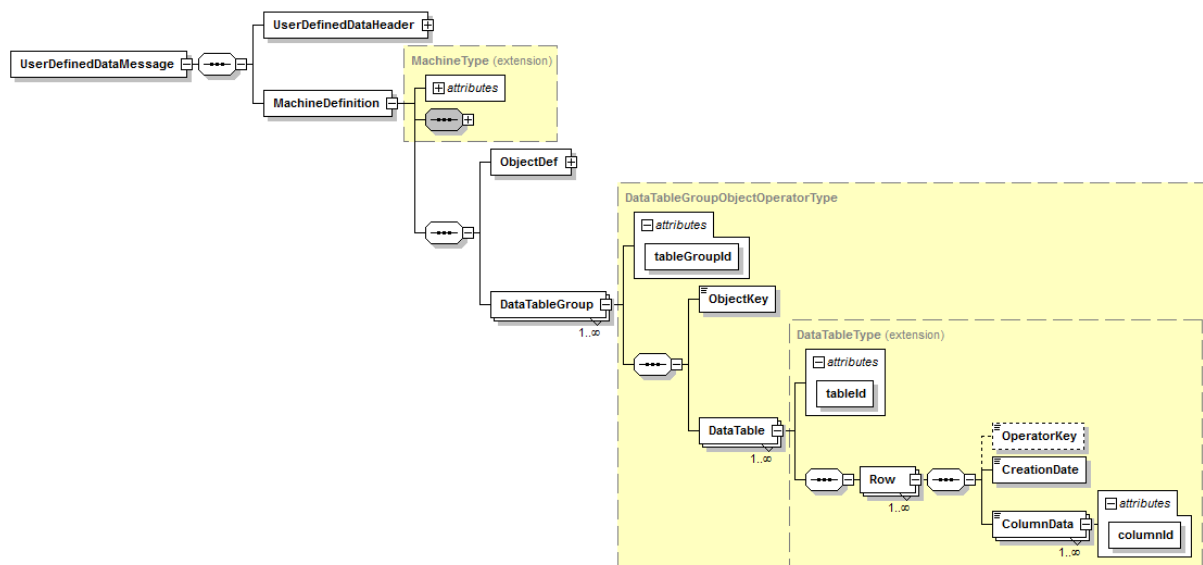
Enumeration list for column “Type” in third table:

| y           | ExtraWorkEvent              | InvoicedMaterial |   |
|-------------|-----------------------------|------------------|---|
| / Date      | Type                        | Quantity         | U |
| 10:36:44.23 | ExtendedForwarding          |                  |   |
|             | ExtendedForwarding          |                  |   |
|             | SpecialForwarding           |                  |   |
|             | SitePreparation, divided ac |                  |   |
|             | MachinePlanting             |                  |   |
|             | YoungStandTreatment pro     |                  |   |
|             | StandInventory (manual me   |                  |   |
|             | UndergrowthCleaning         |                  |   |
|             | Stump Treatment             |                  |   |
|             | ProcessingOfLoggingResid    |                  |   |
|             | CoveringOfEnergyWood        |                  |   |
|             | Machine Transfer            |                  |   |
|             | RoadMaintenance             |                  |   |
|             | ControlMeasurement          |                  |   |

## Output / Report

The data is validated according to the definition before the file is created. This means that all mandatory fields have to be filled in.

Below is a schema example describing the structure for reporting user defined data from the machine:



### XML example

This is an example of the output file (some machine, object and operator information is excluded):

```
<UserDefinedDataMessage xsi:schemaLocation="urn:skogforsk:stanford2010:1:release UserDefinedDataOutput_v2.xsd"
  xmlns="urn:skogforsk:stanford2010:1:release" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <UserDefinedDataHeader>
    <CreationDate>2011-09-23T10:27:48+02:00</CreationDate>
    <ModificationDate>2011-10-04T15:01:50.080+02:00</ModificationDate>
  </UserDefinedDataHeader>
  <MachineDefinition machineCategory="Harvester">
    <MachineKey>12389</MachineKey>
    <MachineUserID>Machine 121</MachineUserID>
    <OperatorDefinition>
      <OperatorKey>2</OperatorKey>
      <OperatorUserID>String</OperatorUserID>
      <ContactInformation>
        <FirstName>Daniel</FirstName>
        <LastName>Smith</LastName>
      </ContactInformation>
    </OperatorDefinition>
    <Extension extensionAction="Copy"/>
  </MachineDefinition>
  <ObjectDef>
    <ObjectUserID agency="LoggingOrganization">String</ObjectUserID>
    <ObjectName>String</ObjectName>
    <ContractNumber ContractCategory="String">String</ContractNumber>
    <RealEstateIDObject agency="LoggingOrganization">String</RealEstateIDObject>
    <ObjectKey>2</ObjectKey>
    <StartDate>2011-09-23T10:27:48+02:00</StartDate>
  </ObjectDef>
  <DataTableGroup tableGroupId="InvoiceSpecification">
    <ObjectKey>54535</ObjectKey>
    <DataTable tableId="InvoicedParty">
      <Row>
        <OperatorKey>3</OperatorKey>
        <CreationDate>2001-12-17T09:30:47Z</CreationDate>
        <ColumnData columnName="CustomerId">35643</ColumnData>
        <ColumnData columnName="Name">BigForest Lmted</ColumnData>
      </Row>
    </DataTable>
    <DataTable tableId="ExtraWorkEvent">
      <Row>
        <OperatorKey>3</OperatorKey>
        <CreationDate>2001-12-17T09:30:47Z</CreationDate>
      </Row>
    </DataTable>
  </DataTableGroup>
</UserDefinedDataMessage>
```

```

<ColumnData columnName="ExtraWorkCategory">YoungStandTreatment</ColumnData>
<ColumnData columnName="BasicsForInvoicingTheWork">Ordered by forest owner </ColumnData>
<ColumnData columnName="Quantity">26</ColumnData>
<ColumnData columnName="Unit">hours</ColumnData>
<ColumnData columnName="Comment">This is a test of invoice extrawork in UserDefinedData</ColumnData>
</Row>
<Row>
  <OperatorKey>3</OperatorKey>
  <CreationDate>2001-12-17T09:30:47Z</CreationDate>
  <ColumnData columnName="ExtraWorkCategory">StandInventory</ColumnData>
  <ColumnData columnName="BasicsForInvoicingTheWork">Ordered by logging company</ColumnData>
  <ColumnData columnName="Quantity">4</ColumnData>
  <ColumnData columnName="Unit">hours</ColumnData>
</Row>
<Row>
  <OperatorKey>3</OperatorKey>
  <CreationDate>2001-12-17T09:30:47Z</CreationDate>
  <ColumnData columnName="ExtraWorkCategory">StandInventory</ColumnData>
  <ColumnData columnName="BasicsForInvoicingTheWork">Ordered by logging company</ColumnData>
  <ColumnData columnName="Quantity">4.5</ColumnData>
  <ColumnData columnName="Unit">ha</ColumnData>
</Row>
</DataTable>
<DataTable tableId="InvoicedMaterial">
  <Row>
    <OperatorKey>3</OperatorKey>
    <CreationDate>2001-12-17T09:30:47Z</CreationDate>
    <ColumnData columnName="Type">ManualHarvesting</ColumnData>
    <ColumnData columnName="Quantity">60</ColumnData>
    <ColumnData columnName="Unit">m3</ColumnData>
  </Row>
  <Row>
    <OperatorKey>3</OperatorKey>
    <CreationDate>2001-12-17T09:30:47Z</CreationDate>
    <ColumnData columnName="Type">SitePreparation, divided according to method</ColumnData>
    <ColumnData columnName="Quantity">0.5</ColumnData>
    <ColumnData columnName="Unit">ha</ColumnData>
  </Row>
</DataTable>
</DataTableGroup>
</MachineDefinition>
</UserDefinedDataMessage>

```

## User interface example

The instruction described above could be illustrated through the following GUI example.

| Invoice Specification    |                |                  |  |
|--------------------------|----------------|------------------|--|
| InvoicedParty            | ExtraWorkEvent | InvoicedMaterial |  |
| OperatorKey / Date       | CustomerId     | Name             |  |
| 3 / 2001-12-17T09:30:47Z | 35643          | BigForest Lmtd   |  |

| Invoice Specification    |                     |                            |          |       |                                     |
|--------------------------|---------------------|----------------------------|----------|-------|-------------------------------------|
| InvoicedParty            | ExtraWorkEvent      | InvoicedMaterial           |          |       |                                     |
| OperatorKey / Date       | ExtraWorkCategory   | BasicsForInvoicingTheWork  | Quantity | Unit  | Comment                             |
| 3 / 2001-12-17T09:30:47Z | YoungStandTreatment | Ordered by forest owner    | 26       | hours | This is a test of invoice extrawork |
| 3 / 2001-12-17T09:30:47Z | StandInventory      | Ordered by logging company | 4        | hours |                                     |
| 3 / 2001-12-17T09:30:47Z | StandInventory      | Ordered by logging company | 4.5      | ha    |                                     |

| Invoice Specification    |                                              |                  |          |      |                  |
|--------------------------|----------------------------------------------|------------------|----------|------|------------------|
| InvoicedParty            | ExtraWorkEvent                               | InvoicedMaterial |          |      |                  |
| OperatorKey / Date       | Type                                         |                  | Quantity | Unit | Comment          |
| 3 / 2001-12-17T09:30:47Z | ManualHarvesting                             |                  | 60       | m3   | Many XXL spruces |
| 3 / 2001-12-17T09:30:47Z | SitePreparation, divided according to method |                  | 0.5      | ha   |                  |