

In/Out Parameters, Binding and Command Code

DDI provides a generic Command Code structure that supports the inclusion of an inline command in a specified programming language, a reference to an external file containing the command code, and the use of a StructuredCommand which serves as an extension stub for the insertion of a command code using an external namespace. CommandCode makes use of the new InParameter, OutParameter, and Binding available in primary locations throughout DDI in order to more clearly define the inputs to processes and algorithms used in collecting, altering, and revising data as it travels through the lifecycle into a data file.

The Command indicates the programming language of the command, specifies InParameters (items of information required to process the command), OutParameters, (items of information generated by the command), Binding (linking the output of an object external to the Command to the InParameter), and the CommandContent. If using a command stored as an external file, CommandFile provides the same program language information, InParameter, OutParameter, and Binding options as well as a description of the file location and a URI for the file.

Command Code

The Command indicates the programming language of the command, specifies InParameters (items of information required to process the command), OutParameters, (items of information generated by the command), Binding (linking the output of an object external to the Command to the InParameter), and the CommandContent. If using a command stored as an external file, CommandFile provides the same program language information, InParameter, OutParameter, and Binding options as well as a description of the file location and a URI for the file.

CommandCode	
Description	(0..1)
Command	(0..1)
ProgramLanguage	(1..1)
InParameter	(0..n)
OutParameter	(0..n)
Binding	(0..n)
CommandContent	(0..1)
CommandFile	(0..1)
ProgramLanguage	(1..1)
InParameter	(0..n)
OutParameter	(0..n)
Binding	(0..n)
Location	(0..1)
URI	(0..1)
StructuredCommand	(0..1)

InParameter, OutParameter, Binding

InParameter and OutParameter share the contents of Parameter. InParameter adds the attribute `limitedArrayIndex` used to specify the object(s) in the zero-based array used by the Parameter. This is used only when the attribute `isArray` is set to "true". The Parameter provides the standard Parameter Name and Description elements. An optional Mnemonic may be defined in cases where a command is written using a Mnemonic. This allows a clear link between, for example, the term AGE in the command "If AGE >= 21" and in InParameter with the Mnemonic value of "AGE". This is particularly useful when using external CommandFile scripts which would not contain the ID of the InParameter in the command. ValueRepresentation allows for a definition of the expected contents and is recommended if you are sharing data with others. DefaultValue provides a value to use if the OutParameter bound to the InParameter provides no value. Binding is a simple linkage indicating the contents of a specified SourceParameter provide the value for the TargetParameter.

Parameter

```
Extension base: IdentifiableType
ParameterName      (0..n)
Mnemonic           (0..1)
Description         (0..1)
ValueRepresentation (0..1)
DefaultValue        (0..1)
@isArray            (default="false")
```

InParameter

```
Extension base: Parameter
@limitArrayIndex
```

OutParameter

```
Type="Parameter"
```

Binding

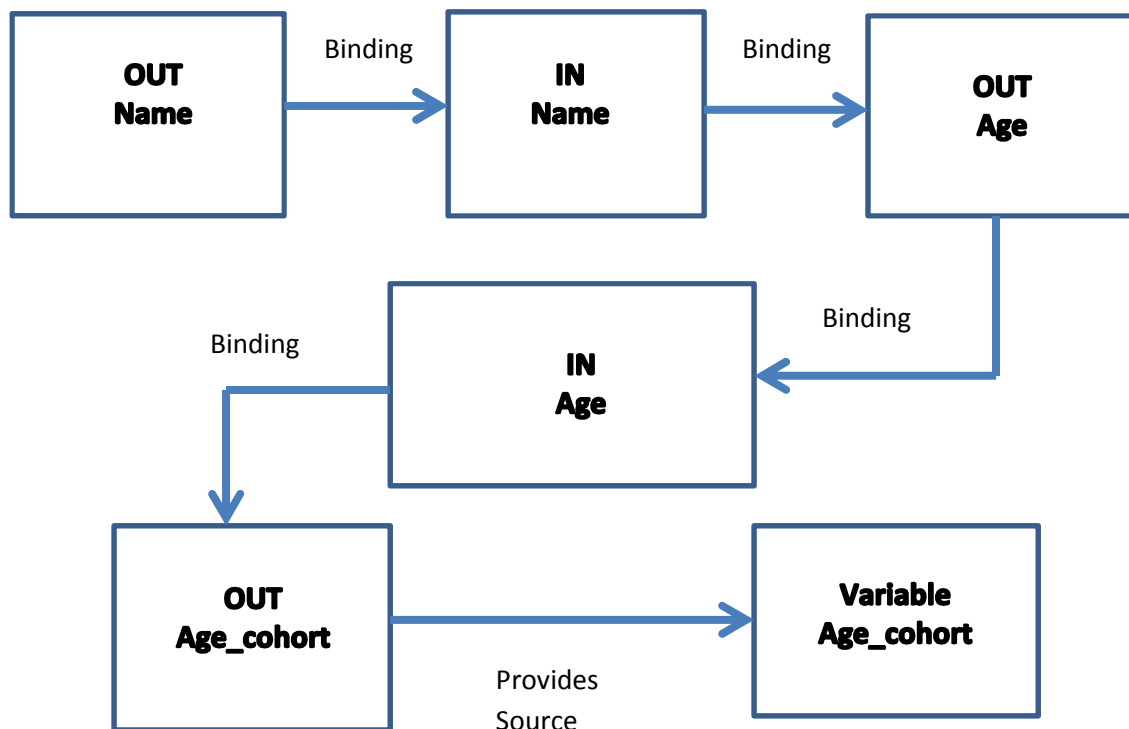
```
SourceParameterReference (1..1)
TargetParamterReference  (1..1)
```

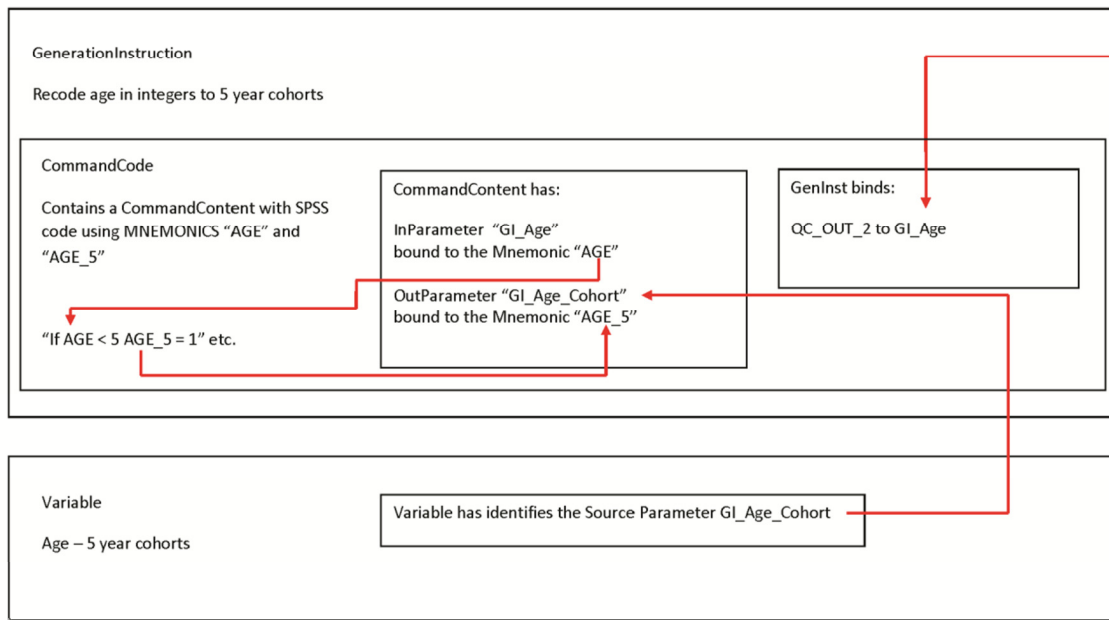
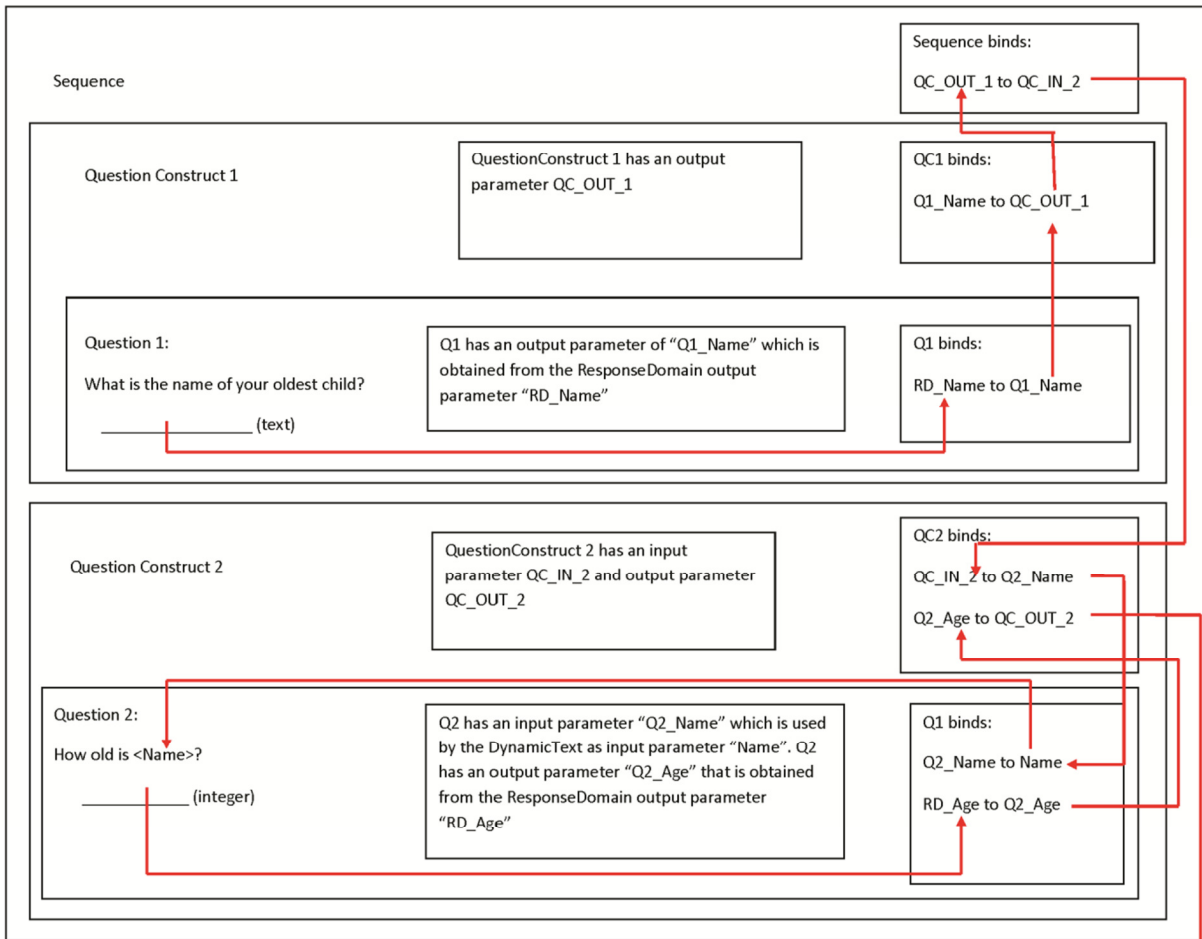
The following chart lists where each of these objects is available within DDI.

OBJECT	IN	OUT	BIND	Source Parameter Reference	Command Code
QuestionItem	x	x	x		
QuestionGrid	x	x	x		
QuestionBlock	x	x	x		
ControlConstruct	x	x	x		
IfCondition					x
UntilCondition					x
WhileCondition					x

InitialValue					x
LoopWhile					x
StepValue					x
ComputationItem					x
ControlConstructReference			x		
InterviewerInstruction	x		x		
GeneralInstruction					x
GenerationInstruction					x
Category/Generation					x
DynamicText	x				
DynamicText/Expression	x				
ResponseDomain		x			
CodeSubsetInfo					x
CommandCode	x	x	x		
Command	x	x	x		
CommandFile	x	x	x		
Variable				x	

The following example tracks the capture of a child's Name to its use in the dynamic text of a subsequent question regarding the child's age, the use of the age response by a generation instruction recoding the provided age into an age cohort, and finally the storage of the age cohort value in a variable.





EXAMPLE:

```
<d:QuestionItem isVersionable="true" typeOfIdentifier="Canonical"
scopeOfUniqueness="Agency">
  <r:URN>urn:ddi:us.mpc:Q1:1</r:URN>
  <r:OutParameter isIdentifiable="true" typeOfIdentifier="Canonical"
scopeOfUniqueness="Agency" isArray="false">
    <r:URN>urn:ddi:us.mpc:Q1_Name:1</r:URN>
  </r:OutParameter>
  <r:Binding>
    <r:SourceParameterReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
      <r:URN>urn:ddi:us.mpc:RD_Name:1</r:URN>
      <r:TypeOfObject>OutParameter</r:TypeOfObject>
    </r:SourceParameterReference>
    <r:TargetParameterReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
      <r:URN>urn:ddi:us.mpc:Q1_Name:1</r:URN>
      <r:TypeOfObject>OutParameter</r:TypeOfObject>
    </r:TargetParameterReference>
  </r:Binding>
  <d:QuestionText><l:LiteralText><l:Text xml:lang
xml:sapce="default">What is the name of your oldest
child?</l:Text></l:LiteralText></d:QuestionText>
  <d:TextDomain>
    <r:OutParameter isIdentifiable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
isArray="false">
      <r:URN>urn:ddi:us.mpc:RD_Name:1</r:URN>
    </r:OutParameter>
    <r:TextDelineationReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
      <r:URN>urn:ddi:us.mpc:TD_1:1</r:URN>
      <r:TypeOfObject>TextDelineation</r:TypeOfObject>
    </r:TextDelineationReference>
  </d:TextDomain>
</d:QuestionItem>
```

```
<d:QuestionItem isVersionable="true" typeOfIdentifier="Canonical"
scopeOfUniqueness="Agency">
  <r:URN>urn:ddi:us.mpc:Q2:1</r:URN>
  <r:InParameter isIdentifiable="true" typeOfIdentifier="Canonical"
scopeOfUniqueness="Agency" isArray="false">
    <r:URN>urn:ddi:us.mpc:Q2_Name:1</r:URN>
  </r:InParameter>
  <r:OutParameter isIdentifiable="true" typeOfIdentifier="Canonical"
scopeOfUniqueness="Agency" isArray="false">
    <r:URN>urn:ddi:us.mpc:Q2_Age:1</r:URN>
  </r:OutParameter>
  <r:Binding>
```

```

    <r:SourceParameterReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
      <r:URN>urn:ddi:us.mpc:RD_Age:1</r:URN>
      <r:TypeOfObject>OutParameter</r:TypeOfObject>
    </r:SourceParameterReference>
    <r:TargetParameterReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
      <r:URN>urn:ddi:us.mpc:Q2_Age:1</r:URN>
      <r:TypeOfObject>OutParameter</r:TypeOfObject>
    </r:TargetParameterReference>
  </r:Binding>
  <d:QuestionText>
    <l:LiteralText><l:Text xml:lang xml:sapce="preseve">How old is
</l:Text><l:LiteralText>
      <r:SourceParameterReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
        <r:URN>urn:ddi:us.mpc:Q2_Name:1</r:URN>
        <r:TypeOfObject>InParameter</r:TypeOfObject>
      </r:SourceParameterReference>
      <l:LiteralText><l:Text xml:lang xml:sapce="preseve"> ?</l:Text>
    </d:QuestionText>
    <d:NumericDomain>
      <r:OutParameter isIdentifiable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
isArray="false">
        <r:URN>urn:ddi:us.mpc:RD_Age:1"</r:URN>
      </r:OutParameter>
      <r:TextDelineationReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
        <r:URN>urn:ddi:us.mpc:ND_1:1</r:URN>
        <r:TypeOfObject>NumericDelineation</r:TypeOfObject>
      </r:TextDelineationReference>
    </d:NumericDomain>
  </d:QuestionItem>

```

```

<d:Sequence isVersionable="true" typeOfIdentifier="Canonical"
scopeOfUniqueness="Agency">
  <r:URN>urn:ddi:us.mpc:SEQ:1</r:URN>
  <r:Binding>
    <r:SourceParameterReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
      <r:URN>urn:ddi:us.mpc:QC_OUT_1:1</r:URN>
      <r:TypeOfObject>OutParameter</r:TypeOfObject>
    </r:SourceParameterReference>
    <r:TargetParameterReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
      <r:URN>urn:ddi:us.mpc:QC_IN_2:1</r:URN>
      <r:TypeOfObject>OutParameter</r:TypeOfObject>
    </r:TargetParameterReference>
  </r:Binding>

```

```

    <d:QuestionConstruct isVersionable="true"
    typeOfIdentifier="Canonical" scopeOfUniqueness="Agency">
        <r:URN>urn:ddi:us.mpc:QC_1:1</r:URN>
        <r:OutParameter isIdentifiable="true"
    typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
    isArray="false">
            <r:URN>urn:ddi:us.mpc:QC_OUT_1:1"</r:URN>
        </r:OutParameter>
        <r:Binding>
            <r:SourceParameterReference isReference="true
    isExternal="false" lateBound="false" typeOfIdentifier="Canonical">
                <r:URN>urn:ddi:us.mpc:Q1_Name:1</r:URN>
                <r:TypeOfObject>OutParameter</r:TypeOfObject>
            </r:SourceParameterReference>
            <r:TargetParameterReference isReference="true
    isExternal="false" lateBound="false" typeOfIdentifier="Canonical">
                <r:URN>urn:ddi:us.mpc:QC_OUT_1:1</r:URN>
                <r:TypeOfObject>OutParameter</r:TypeOfObject>
            </r:TargetParameterReference>
        </r:Binding>
        <r:QuestionReference isReference="true isExternal="false"
    lateBound="false" typeOfIdentifier="Canonical">
            <r:URN>urn:ddi:us.mpc:Q1:1</r:URN>
            <r:TypeOfObject>QuestionItem</r:TypeOfObject>
        </r:QuestionReference>
    </d:QuestionConstruct>
    <d:QuestionConstruct isVersionable="true"
    typeOfIdentifier="Canonical" scopeOfUniqueness="Agency">
        <r:URN>urn:ddi:us.mpc:QC_2:1</r:URN>
        <r:InParameter isIdentifiable="true" typeOfIdentifier="Canonical"
    scopeOfUniqueness="Agency" isArray="false">
            <r:URN>urn:ddi:us.mpc:QC_IN_2:1"</r:URN>
        </r:InParameter>
        <r:OutParameter isIdentifiable="true"
    typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
    isArray="false">
            <r:URN>urn:ddi:us.mpc:QC_OUT_2:1"</r:URN>
        </r:OutParameter>
        <r:Binding>
            <r:SourceParameterReference isReference="true
    isExternal="false" lateBound="false" typeOfIdentifier="Canonical">
                <r:URN>urn:ddi:us.mpc:QC_IN_2:1</r:URN>
                <r:TypeOfObject>OutParameter</r:TypeOfObject>
            </r:SourceParameterReference>
            <r:TargetParameterReference isReference="true
    isExternal="false" lateBound="false" typeOfIdentifier="Canonical">
                <r:URN>urn:ddi:us.mpc:Q2_Name:1</r:URN>
                <r:TypeOfObject>OutParameter</r:TypeOfObject>
            </r:TargetParameterReference>
        </r:Binding>
    </d:QuestionConstruct>

```

```

        <r:SourceParameterReference isReference="true
isExternal="false" lateBound="false" typeOfIdentifier="Canonical">
            <r:URN>urn:ddi:us.mpc:Q2_Age:1</r:URN>
            <r:TypeOfObject>OutParameter</r:TypeOfObject>
        </r:SourceParameterReference>
        <r:TargetParameterReference isReference="true
isExternal="false" lateBound="false" typeOfIdentifier="Canonical">
            <r:URN>urn:ddi:us.mpc:QC_OUT_2:1</r:URN>
            <r:TypeOfObject>OutParameter</r:TypeOfObject>
        </r:TargetParameterReference>
    </r:Binding>
    <r:QuestionReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
        <r:URN>urn:ddi:us.mpc:Q2:1</r:URN>
        <r:TypeOfObject>QuestionItem</r:TypeOfObject>
    </r:QuestionReference>
</d:QuestionConstruct>
</d:Sequence>

```

```

<d:GenerationInstruction isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency">
    <r:URN>urn:ddi:us.mpc:GI:1</r:URN>
    <r:CommandCode>
        <r:Command>
            <r:InParameter isIdentifiable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
isArray="false">
                <r:URN>urn:ddi:us.mpc:GI_Age:1</r:URN>
                <r:Mnemonic>AGE</r:Mnemonic>
            </r:InParameter>
            <r:OutParameter isIdentifiable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
isArray="false">
                <r:URN>urn:ddi:us.mpc:GI_Age_Cohort:1</r:URN>
                <r:Mnemonic>AGE_5</r:Mnemonic>
            </r:OutParameter>
            <r:Binding>
                <r:SourceParameterReference isReference="true
isExternal="false" lateBound="false" typeOfIdentifier="Canonical">
                    <r:URN>urn:ddi:us.mpc:QC_OUT_2:1</r:URN>
                    <r:TypeOfObject>OutParameter</r:TypeOfObject>
                </r:SourceParameterReference>
                <r:TargetParameterReference isReference="true
isExternal="false" lateBound="false" typeOfIdentifier="Canonical">
                    <r:URN>urn:ddi:us.mpc:GI_Age:1</r:URN>
                    <r:TypeOfObject>InParameter</r:TypeOfObject>
                </r:TargetParameterReference>
            </r:Binding>
        </r:Command>
    </r:CommandCode>
</d:GenerationInstruction>
<r:ProgramLanguage>SPSS</r:ProgramLanguage>

```

```
        <r:CommandContent>If (AGE < 5) AGE_5=1; If (AGE >=5) & (AGE <
10) AGE_5=2; If (AGE >=10 & (AGE < 15) AGE_5=3; If (AGE >=15 & (AGE <
20) AGE_5=4; If (AGE >=20 AGE_5=5</r:CommandContent>
    </r:Command>
    <r:CommandCode>
</d:GenerationInstruction>
```

```
<l:Variable isVersionable="true" typeOfIdentifier="Canonical"
scopeOfUniqueness="Agency">
    <r:URN>urn:ddi:us.mpc:V1:1</r:URN>
    <r:VariableName><r:String xml:lang="en">Age 5 year
cohorts</r:String></r:VariableName>
    ...
    <r:SourceParameterReference isReference="true isExternal="false"
lateBound="false" typeOfIdentifier="Canonical">
        <r:URN>urn:ddi:us.mpc:GI_Age_Cohort:1</r:URN>
        <r:TypeOfObject>OutParameter</r:TypeOfObject>
    </r:SourceParameterReference>
    ...
</l:Variable>
```