



Rowa® Technologies

Becton Dickinson Rowa Germany GmbH

WWKS 2+ for Digital Shelves

Revision 0.7

Revisions

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0.7.1	09.04.2021	Added missing chapters for query item master data and query article relations use cases	Andreas Kohlhof
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1 Introduction

What is this document about?

This document describes communication between a pharmacy IT system and a device supporting pharmacy workflows via the WWKS 2+ protocol.

Messages are exchanged in both directions. Depending on the device and workflow, different messages of this specification are used.

This specification lists all available messages, their use and syntax. A software developer may use this information to enable successful communication between a pharmacy IT system and a device via WWKS 2+.

Who should read this document?

This document is intended for:

- Personnel involved in integrating a pick-up terminal to a pharmacy IT system
- Developers developing software (such as parsers) to translate between WWKS 2 messages and the pharmacy IT system

Definition of terms

The systems are abbreviated as follows in places within the text:

Abbreviation	Definition
PIS	Pharmacy IT system
SSD	Sales support device
ASRS	Automated storage and retrieval system. In the context of this document, an automated storage and retrieval system also means a system comprising multiple interconnected automatic storage machines with or without a shared control computer
FMD	Falsified Medicine Directive. EU regulation that enforces datamatrix codes on Rx packs and introduce serial number that allow to track packs.

2 Communication between a pharmacy IT system and connected devices

Although there are a lot of different devices and use cases, the data exchanged in a pharmacy is usually the same with just minor deviations. Therefore WWKS 2+ does not define device interfaces

but models reoccurring workflows consistently to allow definition of new use case using existing interface capabilities.

Depending on use case and devices some protocol elements marked as optional may become mandatory for this use case. Please refer to the description of the use cases for details.

The WWKS 2+ protocol defines the term **Capability** that allows PIS and device to signal their support for a specific use cases and the protocol elements needed for it.

PIS and device may decide themselves, which capabilities they support. Anyway, if a capability is supported, all aspects of it have to be implemented.

For already known device types, chapter 0 list the capabilities usually supported.

WWKS 2+ currently defines three main layers of supported systems:

2.1 Storage (Automated Storage and Retrieval Systems)

Automated Storage and Retrieval Systems (ASRS) have been supported already by previous versions of WWKS. WWKS 2+ is based on these interfaces and includes all well-known use cases and the messages defined in WWKS 2.

2.2 Digital Shopping (Sales Support Devices)

WWKS 2+ extends WWKS 2 by the support of additional use cases beyond the integration of ASRS', most of all the integration of devices supporting sales transactions in a pharmacy.

A Sales Supporting Device (SSD) enables pharmacy staff and customers to view or modify the state of a sales transaction.

Samples:

- Information displays
- Digital shelf
- Consultation terminals
- Self-service terminal
- Pick-up terminal
- Self-service cash register

2.3 Commercial Excellence

Next to devices that directly support logistic or sales workflows, WWKS 2+ allows to integrate software components that optimize the workflows and marketing activities managed by the pharmacy IT system.

These components access, modify and play back data managed by the PIS.

Examples:

- Optimized price calculation
- Optimizing of cross selling recommendations
- Category management

3 Protocol design principles

WWKS 2+ defines an open standard of communication protocols for the integration between a pharmacy IT system and supporting devices of different categories and vendors.

The protocol design bases on several assumptions about the use context and principles derived from the assumptions described in this chapter. This serves on the one hand for a better understanding and on the other hand represents a guideline for future protocol extensions.

3.1 Assumptions

The following assumptions form the basis of the protocol:

1. All system vendors in the pharmacy environment have interest in making their systems to cooperate as seamlessly as possible with other market players – for the benefit of their joined customers.
2. All system vendors want to minimize the number of interfaces they have to implement and want to reduce integration efforts as much as possible.
3. Communication protocols define both messages and behaviors. The more defined the behavior is, the less misunderstandings between communication partners may occur.
4. To minimize development efforts and error rates, the published protocol has to be stable over time.
5. Usage of well-established technologies like XML, XSD, JSON or REST supports reduction of development efforts and error rates.
6. Different systems of the same device category do not differentiate themselves in competition through the use of proprietary communication protocols, but in the functions that are based on the communication protocols. Communication protocols in real-life use should therefore be published at a central location in the sense of an open standard and be freely accessible and usable for all market partners without patent or license obligations.
7. Vendor specific enhancements of the communication protocols are unavoidable.
8. Within one pharmacy, systems of different vendors and different device categories might be in use. Protocol updates and enhancements for one area must not enforce updates in other areas.
9. The heterogeneous system landscape in the pharmacy does not permit to update all systems in parallel to a new version of the protocol. It must always be assumed that the different systems receive their updates according to their own rhythm.
10. The market acts faster than standardization bodies. New systems and new ideas often require new communication protocols. New protocols or protocol extensions should therefore be expediently promoted by the market partners involved. Central bodies are suitable for reaching agreements that an already published protocol is to be supported by the association participants. For the development of completely new protocols, the central standardization bodies are usually too slow or the voting effort is unacceptably high.
11. WWKS2+ deals exclusively with communication between systems within the local, protected pharmacy network. Connection to systems which are operated outside the local pharmacy network requires further concepts, e.g. in the area of authentication and authorization, which are deliberately not dealt with in WWKS2+.

3.2 Principles

The above-mentioned assumptions result in principles that are applied in the definition, further development and expansion of WWKS2+.

3.2.1 Family of independent device category protocols

WWKS 2+ is a protocol family that consists of multiple dedicated device category protocols on the application layer. Each device category defines its own workflows based on a common WWKS 2+ base architecture. There must not be protocol dependencies between different device category protocols. The protocol of one device category must be able to advance without impact onto other categories.

3.2.2 Public release of extension

Market players who want to extend the published protocol to enable new features, may implement these themselves or ask the creator of the existing functionality. In complex cases consultation with other users may help to get broader support for the enhancement.

In any case, the enhancement should be made available to the public latest after successful test in real life. This avoids multiple different protocols enhancements for the same use case.

3.2.3 Version control

Each capability (see chapter 6) of WWKS 2+ and each future enhancement have an unambiguous version number following this schema:

```
WWKS2 <Capability>-<Major>.<Minor>[-<Variant>]
```

With

<Capability>:	Name of the capability e.g. PickingRobot ItemDisplay
<Major>:	Increasing number. Increased if the new revision contains breaking changes in the interface.
<Minor>:	Increasing number. Increased, if all changes of the new revision do not break existing implementations.
<Variant>:	Vendor defined.

Remark: Even if two market player agree to not disclose a protocol enhancement, they should use a unique version number to mark their enhancement.

Each new version contains

- A full textual description
- A description of changes to the previous version
- An XSD-Schema¹ and
- If possible, a programming library or a reference implementation for both sides of the communication channel.

¹ If necessary, the schema should use the <openContent> element of XSD 1.1 to enable extensions beyond the defined version in schema validations.

3.2.4 No room for interpretation

The named version of a device protocol is a binding contractual basis between the communication partners. Each protocol version must be defined and described in such a way that it leaves no room for interpretation in the use and meaning of the defined messages and structures. A communication partner must always be able to rely on the fact that all market participants behave completely the same and version-conformant with the same protocol version.

3.2.5 Open-closed principle for enhancements

The WWKS2+ protocol architecture supports the open-closed principle². This means that each vendor supporting a device category protocol version assures to

- (a) Support behavior, structure and interpretation of messages and their content without changes permanently over time according to the protocol specification. It may expect this as well from its communication partners (closed protocol).

On the other hand

- (b) Both partners are allowed to transmit any additional messages or message attributes that are not part of the well-defined protocol version. The communication partner must be able to safely ignore unknown messages and message elements without system error or stop of communication (Open for protocol enhancements).

It is most important that an enhancement of the protocol never implies a structural or behavioral change of the existing protocol.

3.2.6 Protocol transparent connection

The establishment of the (network) connection needed to exchange the messages is not part of the device class protocol itself. Device class protocols act on the application layer but not on the session layer.

Usually the protocol client establishes the connection, though is not part of the protocol specification. Establishing and terminating the connection are protocol-transparent operations that must not be used to transmit application-specific states or information.

The start of a new session is initiated by a `HelloRequest/HelloResponse` handshaking, the termination of a session by a corresponding status message or a `new HelloRequest/HelloResponse` handshaking. In particular, a device class protocol must not stipulate that a communication partner must terminate the underlying connection in certain domain-oriented states. Every communication partner must expect the underlying connection to be interrupted at all times. The communication partner who previously initiated the connection setup is then responsible for re-establishing the connection.

3.2.7 Version configuration instead of dynamic negotiation

The agreement of the concrete protocol version used between two communication partners is not part of WWKS2+ and takes place outside the protocol. Dynamic, program-controlled negotiation of the version is not provided for in WWKS2+. The version identifiers transmitted in `HelloRequest` and

² https://en.wikipedia.org/wiki/Open%E2%80%93closed_principle

HelloResponse serve the sole purpose of logging and as an aid in the analysis of communication problems.

3.2.8 Handling of required licenses for transmitted data outside the protocol

Licenses may be required to use data transmitted via WWKS2+. The WWKS2+ protocol does not provide a check whether corresponding usage rights exist. This must be ensured outside the protocol.

4 Technical basics of communication

Communication between the PIS and the device is handled via the TCP/IP protocol.

Alternative transmission paths for the messages defined in this document are generally possible, but are not the subject of this specification.

The IP address of the device in the pharmacy network is either assigned via DHCP or configured as a fixed address.

Whether the device or the PIS acts as a server depends on the device class.

Device which are critical for pharmacy workflows (e.g. ASRS) or devices to which a PIS wants to establish multiple connections, usually acts as server. Device which are in case of failure non-critical for the pharmacy workflows (e.g. screens) usually act as clients. PIS and device vendor may agree on different setups.

The default port for communication via WWKS 2 is 6050. Different port configurations should be configurable on both sides.

It is possible to connect several device to the PIS via only one socket connection. To distinguish different devices, the messages contain device ids that are unique within the pharmacy. See sections 5.3 Device Numbers and 7.1 Connection establishment for details.

It is recommend to use different connections for different device categories.

Methods for securing the connection in unsafe environments are currently not part of the WWKS 2+ specification.

The respective server waits for incoming requests from the client. The data connection is established exclusively by the client and remains active as long as the device and PIS are in operation. The connection is not opened and closed for every single operation. The client is responsible for re-establishing the connection immediately after an abort. If this fails, it will repeat the recovery attempt at regular intervals.

UTF8-encoded XML messages are exchanged in both directions via the connection.

After establishing the connection, the client sends a `HelloRequest` within five seconds. The server closes the connection if no `HelloRequest` is received within this time period (see section 7.1 Connection establishment).

5 Devices and components in the pharmacy

With the WWKS2+ interfaces, a wide variety of devices and software components can be integrated into a pharmacy's sales and logistics processes managed by the pharmacy IT system.

The devices take over certain roles for which only parts of WWKS2+ are required. WWKS2+ is represented by capabilities that bundle related use cases in a meaningful way.

Devices and pharmacy IT systems implement a capability always completely and can rely on each other that the other side implements all use cases belonging to a capability. In the connection setup, both sides specify which capabilities are supported in the current configuration.

This chapter describes already known device categories and defines how they are integrated into the workflows of the pharmacy and which capabilities are required as mandatory or optional for PIS and device.

5.1 Pharmacy workflows

5.1.1 Basic workflow good receipt

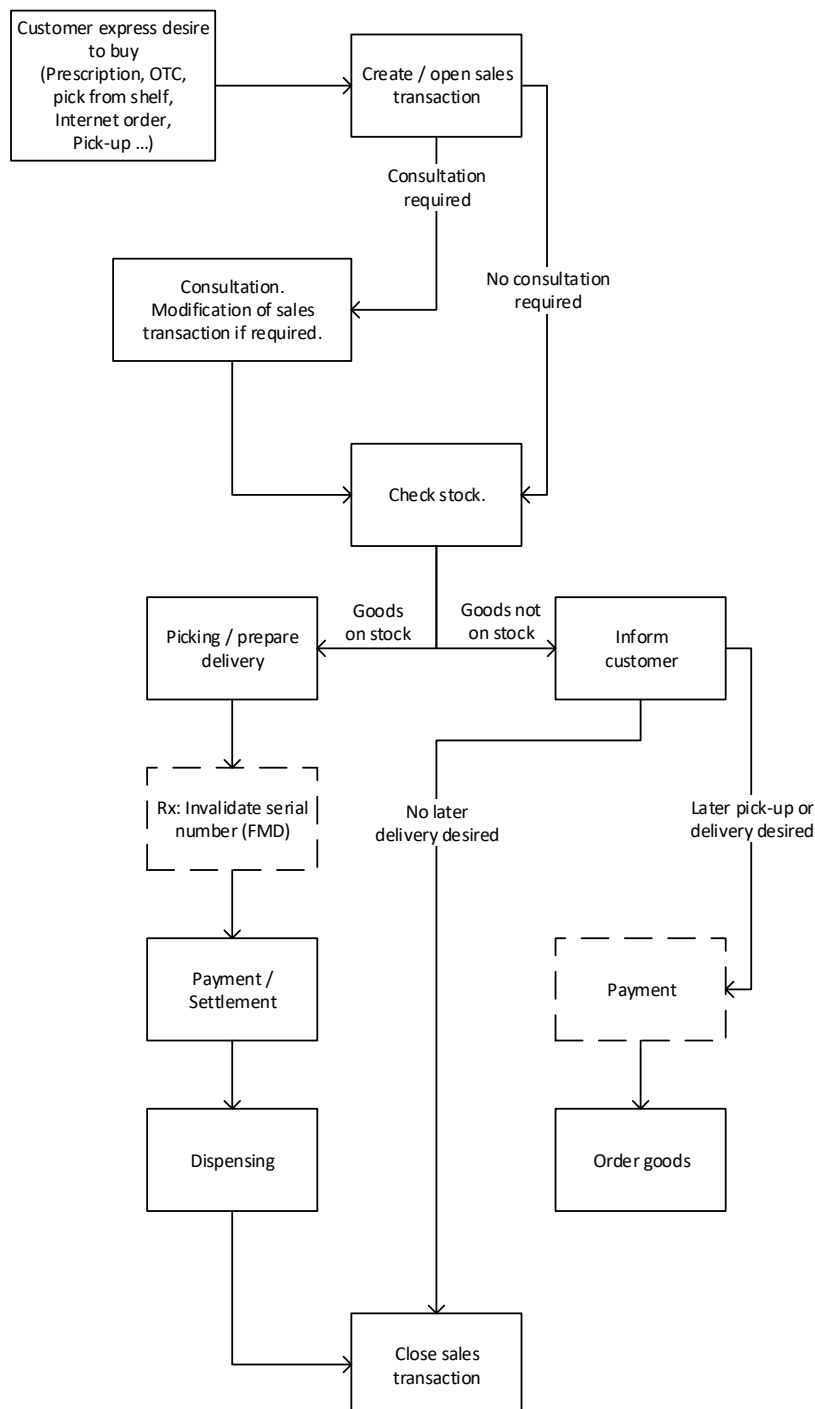
Please refer to full WWKS2+ specification, not relevant for digital shelves.

5.1.2 Basic workflow sale

Purpose

Customer buys items in the pharmacy, either in person or electronically

Sequence



5.2 Point of sales

A **point of sale** is a place in a pharmacy where only one customer can be served exclusively at a time. At a point of sale, several devices can participate together in the sales process for this customer.

A point of sale has an ID defined by the PIS. These are independent of the device numbers and can overlap with the number ranges for device numbers. For example, they can correspond to the device numbers of the PIS cash registers.



5.3 Device numbers

For communication via WWKS2+, each device that is connected to the pharmacy IT system (PIS) is uniquely identified by a device number.

The device number is configured in the device and communicated to the PIS during connection setup. The device manufacturer ensures that no two devices connected to the PIS via the same connection use the same number.

In each message and each request for a new use case, the initiator of the communication specifies its own device number as the `source` and the target device number as `destination`. In replies to these messages, the received `source` is returned as `destination` so that the receiver can route the response to the original message source. The own device number is entered as `source` in the reply.

Sub-components of a device can use their own device numbers in outgoing messages. They do not have to be listed explicitly in the `HelloRequest`, but then cannot be explicit recipients of messages from the PIS (except for replies to requests from the sub-component).

If a message is not addressed to a specific device, `destination "0"` is used.

The following device numbers and number ranges are defined:

Number	Device
0	Broadcast to all connected devices
100	PIS
101..199	Device of the PIS vendors (e.g. cash register).
200..999	Devices of other vendors connected to the PIS

5.4 Device categories

5.4.1 Pharmacy IT system

The pharmacy IT system (PIS) manages the stock of the pharmacy and has sovereignty over the sales and logistics processes in the pharmacy. It manages the article master and the stock.

It has at least one central server that manages the connections to the devices. In addition, there may be other PIS devices or components in the pharmacy which, if required, also establish direct connections to individual devices (in particular picking robots).

`Subscriber.Type` in the `HelloRequest`: „WMS“

5.4.2 Automated Storage and Retrieval System

Please refer to full WWKS2+ specification.

5.4.3 Sales supporting devices at a point of sale

A **sales supporting device** (SSD) is a device that is integrated temporarily in a sales workflow managed by the PIS. It is always assigned to a point of sale known to the PIS. A **point of sale** is a location in the pharmacy where, at one point in time, one patient is served exclusively.

All sales supporting devices assigned to a point of sale work together on the current **sales transaction** and may initiate modifications and actions (e.g. payment, delivery) on the transaction.

In case the sales transaction workflow continues at another point of sale, the PIS has to transfer the transaction to this point of sale explicitly.

The integration of sales systems that manage stock and transactions on their own is not in scope von WWKS2 2+.

A sales supporting device may be a device of the PIS vendor or of another vendor.

A SSD may be configured to support multiple points of sale, but must then ensure that it uniquely handles only one assigned point of sale at a time and supports the operator in switching between the points of sale.

Examples: Cash register, self-service cash register, pick-up terminal, digital shelf

5.4.3.1 Digital OTC shelf

A digital OTC shelf replaces a physical OTC shelf. It displays parts of the OTC assortment, allows the selection of individual articles to display detailed information and can add them to a shopping cart. It usually shares a sales point with a PIS cash register that is managing the current sales transaction of the sales point.

A digital OTC shelf is operated exclusively by pharmacy staff.

Relevant capabilities	Mandatory / Optional	Rowa Vmotion
Connection setup (Connect)	Mandatory	Supported
Display item information (ItemDisplay)	Mandatory	Supported
Item selection (ArticleSelection)	Mandatory	Supported
Price change indication (LivePriceUpdate)	Optional	Planned
Query PIS stock (StockQuery)	Optional	Planned
(Deprecated) Manage shopping carts (ShoppingCarts)	<i>Deprecated, replaced by ArticleSelection</i>	Supported
(Deprecated) Shopping cart update notification (ShoppingCartUpdateMessage)	<i>Deprecated</i>	Not supported
(Deprecated) Transfer of shopping carts (ShoppingCartTransfer)	<i>Deprecated</i>	Not supported

Typical role of the device in a WWKS 2+ connection: Client

Subscriber.Type in HelloRequest: „OTCDisplay“

5.4.3.2 Digital self-service shelf

A digital self-service shelf replaces or complements a shelf in the pharmacy that is accessible to customers. It displays part of the OTS assortment and may be used to query detail information about products. A customer may add items shown on the display to its shopping cart.

Relevant capabilities	Mandatory / Optional	Rowa Vmotion
Connection setup (Connect)	Mandatory	Supported
Display item information (ItemDisplay)	Mandatory	Supported
Item selection (ArticleSelection)	Mandatory	Planned
Price change indication (LivePriceUpdate)	Optional	Planned
Query PIS stock (StockQuery)	Optional	Planned
(Deprecated) Manage shopping carts (ShoppingCarts)	<i>Deprecated, replaced by ArticleSelection</i>	Supported

(Deprecated) Shopping cart update notification (ShoppingCartUpdateMessage)	<i>Deprecated</i>	Not supported
(Deprecated) Transfer of shopping carts (ShoppingCartTransfer)	<i>Deprecated</i>	Not supported

Typical role of the device in a WWKS 2+ connection: Client

Subscriber.Type in HelloRequest: „SelfServiceDisplay“

5.4.3.3 Pick-up terminal

Please refer to full WWKS2+ specification.

5.4.3.4 Self-checkout cash register

Please refer to full WWKS2+ specification.

5.4.3.5 Information and Order terminals

Please refer to full WWKS2+ specification.

5.4.4 Screens

Please refer to full WWKS2+ specification.

5.4.5 Commercial excellence components

Please refer to full WWKS2+ specification.

6 Capabilities

A **capability** is a combination of supported WWKS 2+ messages, message attribute and use cases, that a device or system supports either fully or not at all.

Each capability has a unique name and a version number (cf. chapter 3.2.3 Version control).

6.1 Connection setup (Connect)

When setting up the connection (see chapter 4), the communication partners exchange information about the capabilities they support. *Connect* is the only use case that each WWKS 2+ system has to implement. It is not listed as capability in the *Hello* dialogue or as presupposed for other capabilities.

For connection setup, support of the following elements is required:

Name	<i>Connect</i>	Version	1.0
Presupposed capabilities		<i>none</i>	
Use Cases to support		Affected capabilities, if supported	
7.1 Connection establishment			
Messages to support		Elements/Attributes/Values to support	
HelloRequest / HelloResponse		Capability	
KeepAliveRequest / KeepAliveResponse		<i>None</i>	

6.2 Capabilities from WWKS2

Please refer to full WWKS2+ specification, not required for digital shelves.

6.3 Stock management

6.3.1 Default features of a picking robot (PickingRobot)

Please refer to full WWKS2+ specification, not required for digital shelves.

6.3.2 Batch number handling (BatchTracking)

Please refer to full WWKS2+ specification, not required for digital shelves.

6.3.3 Handling of datamatrix codes (Datamatrixcodes)

Please refer to full WWKS2+ specification, not required for digital shelves.

6.3.4 Serial numbers (Serialization)

Please refer to full WWKS2+ specification, not required for digital shelves.

6.3.5 Query and process FMD validation results of a serial number (SerialValidationResults)

Please refer to full WWKS2+ specification, not required for digital shelves.

6.3.6 Query PIS stock (StockQuery)

A device may query the current stock of the pharmacy to provide information about item availability.

Name	QueryStock	Version	1.0
Presupposed capabilities		Connect	
Use cases to support		Use cases affected, if supported	
7.6.4.1 Query article stock			
Messages to support <i>Affected messages, if supported</i>		Elements/attributes/values to support	
StockInfoRequest / StockInfoResponse		IncludePacks="False"	
Affected data types		Elements/attributes/values to support	
Search Criteria		Article	
Article		Quantity Availability	

6.4 Item display

6.4.1 Display item information (ItemDisplay)

The device is able to show current information for one or multiple articles to customers.

Item master data transfer is not part of this capability.

Name	<i>ItemDisplay</i>	Version	1.0
Presupposed capabilities		Connect	
Use cases to support		Use cases affected, if supported	
7.3.3 Query item master data 7.4.1 Query current price			
Messages to support Affected messages, if supported		Elements/attributes/values to support	
ArticlePriceRequest / ArticlePriceResponse			
ArticleInfoRequest / ArticleInfoResponse			
Affected data types		Elements/attributes/values to support	
Search Criteria		ArticleId	
Article			
Price			

6.4.2 Price change indication (LivePriceUpdate)

The PIS informs that the prices have changed at the moment the changes becomes effective.

Name	<i>LivePriceUpdate</i>	Version	1.0
Presupposed capabilities		Connect	
Use cases to support		Use cases affected, if supported	
7.4.1 Query current price			
7.4.2 Price change notification			
Messages to support <i>Affected messages, if supported</i>		Elements/attributes/values to support	
ArticlePriceRequest / ArticlePriceResponse			
ArticlePriceMessage			
Affected data types		Elements/attributes/values to support	
Search Criteria		ArticleId	
Price			

6.4.3 Relations between Items (ItemRelations)

A device may query the PIS about relations between article, e.g. to propose cross selling or alternative pack sizes.

Name	ItemRelations	Version	1.0
Presupposed capabilities		Connect	
Use cases to support		Use cases affected, if supported	
7.5.1 Query article relations			
Messages to support <i>Affected messages, if supported</i>		Elements/attributes/values to support	
ArticleRelationRequest / ArticleRelationResponse			
Affected data types		Elements/attributes/values to support	
Article relation		ArticleRelation.Type={CrossSelling, Alternative, AlternativePacksize} ³	

6.5 Sales transactions

6.5.1 (Deprecated) Shopping cart update notification (ShoppingCartUpdateMessage)

Deprecated. The support of this capability is deprecated for digital shelves. Please use 6.5.7 Item selection instead.

The PIS informs connected devices about changes in sales transactions that are currently processed at any sales point of the pharmacy.

The device uses this information to update the content it displays to customers or to update the content of its shopping cart.

³ The list of article returned might be empty if the PIS relation is not maintained in the PIS.

Name	<i>ShoppingCartUpdate</i>	Version	<i>1.0</i>
Presupposed capabilities		Connect	
Use cases to support		Use cases affected, if supported	
7.9.9 Inform about shopping cart modifications			
Messages to support <i>Affected messages, if supported</i>		Elements/attributes/values to support	
(Deprecated) ShoppingCartUpdateMessage			
Affected data types		Elements/attributes/values to support	
Shopping Cart		ShoppingCart.SalesPointId	

6.5.2 (Deprecated) Manage shopping carts (ShoppingCarts)

Deprectated. The support of this capability is deprecated for digital shelves. Please use 6.5.7 Item selection instead.

Requests of shopping carts and add, modify or delete lines from them.

Name	<i>ShoppingCarts</i>	Version	1.0
Presupposed capabilities		Connect	
Use cases to support		Use cases affected, if supported	
7.9.1 (Deprecated) Request shopping cart			
7.9.2 (Deprecated) Modify shopping cart			
7.9.5 (Deprecated) Terminate handling of shopping cart at a device			
Messages to support <i>Affected messages, if supported</i>		Elements/attributes/values to support	
(Deprecated) ShoppingCartRequest / (Deprecated) ShoppingCartResponse			
ShoppingCartUpdateRequest / ShoppingCartUpdateResponse		Add ChangeQuantity Transfer	
Affected data types		Elements/attributes/values to support	
Shopping Cart		ShoppingCart.Status, ShoppingCart.SalesPointId, ShoppingCartItem.ArticleId ShoppingCartItem.Name ShoppingCartItem.OrderedQuantity, ShoppingCartItem.Price ShoppingCartItem.Currency ShoppingCartItem.VAT	

6.5.3 Scan barcodes (BarcodeScan)

Please refer to full WWKS2+ specification, not required for digital shelves.

6.5.4 Delivery of shopping carts (ShoppingCartDelivery)

Please refer to full WWKS2+ specification, not required for digital shelves.

6.5.5 Payment of shopping carts

Please refer to full WWKS2+ specification, not required for digital shelves.

6.5.6 (Deprecated) Transfer of shopping carts (ShoppingCartTransfer)

Deprecated. The support of this capability is deprecated for digital shelves. Please use 6.5.7 Item selection instead.

Request of a device to transfer a shopping cart to another sales point

Name	<i>ShoppingCartTransfer</i>	Version	1.0
Presupposed capabilities		ShoppingCarts	
Use cases to support		Use cases affected, if supported	
7.9.8 Transfer shopping cart to another sales point			
Messages to support <i>Affected messages, if supported</i>		Elements/attributes/values to support	
(Deprecated) ShoppingCartRequest / (Deprecated) ShoppingCartResponse			
ShoppingCartUpdateRequest / ShoppingCartUpdateResponse		Transfer	
Affected data types		Elements/attributes/values to support	
Shopping Cart		ShoppingCart.SalesPointId	

6.5.7 Item selection (ArticleSelection)

A device informs the PIS that a user has selected a specific quantity of an article, e.g. for adding the items to the current sales transaction at the sales point the device is linked to.

Name	<i>ArticleSelection</i>	Version	1.0
Presupposed capabilities		Connect	
Use cases to support		Use cases affected, if supported	
7.9.11 Select Item			
Messages to support <i>Affected messages, if supported</i>		Elements/attributes/values to support	
ArticleSelectedMessage			
Affected data types		Elements/attributes/values to support	

6.5.8 ShoppingCart article master data (ShoppingCartArticleMaster)

Please refer to full WWKS2+ specification, not required for digital shelves.

7 Use cases

Pharmacy IT system ownership of workflows

The pharmacy IT system owns and manages all workflows in the pharmacy. The communication between the devices in the pharmacy should always be coordinated by the pharmacy IT system to ensure consistent workflow logic and behavior.

Direct communication between different devices makes sense as a fallback solution if the PIS does not support the coordinating function for the respective use case.

Capabilities

When establishing the WWKS 2+ connection, both sides exchange information which of the use case described in this document they support. The use cases are bundled to capabilities. Each system has to support all elements of a capability (see chapter 6 Capabilities).

7.1 Connection establishment

Purpose

This use case is used to ensure that a connected socket is really used to talk WWKS 2+ and to exchange information about the capabilities supported by both sides.

Only the capabilities that are supported by the current configuration are communicated. Basically supported abilities, which still have to be "switched on", are not listed.

In difference to WWKS 2, the listing of supported skills is mandatory in WWKS 2+.

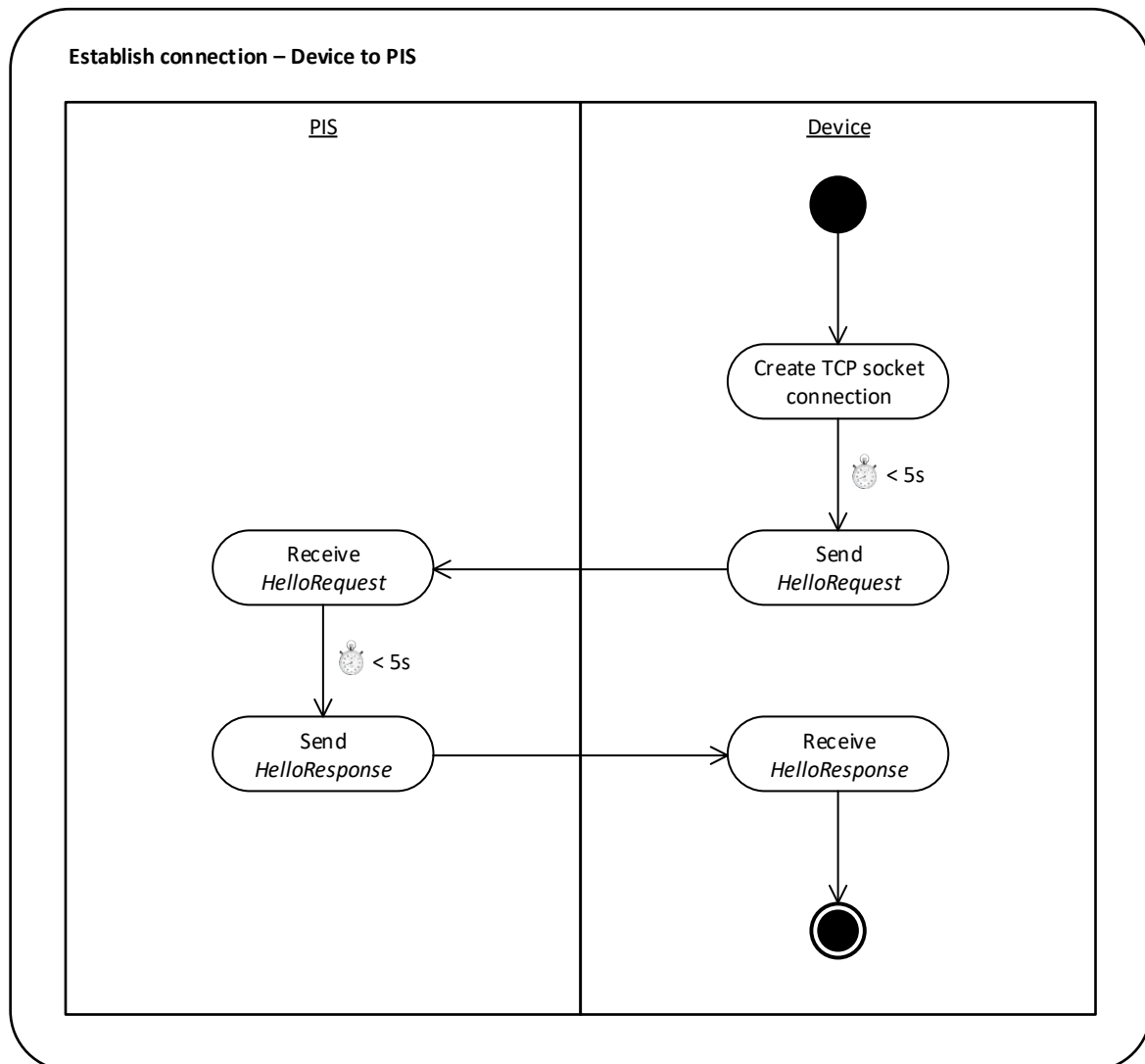
If a side requires certain capabilities of the other side, but these are not listed by it, it will terminate the socket connection after completion of the Hello dialog. The missing capability is not communicated via the interface, but via a feedback message to the user of the respective system.

Both sides do not accept any other WWKS 2+ messages before the connection has been successfully established.

Connection establishment by the PIS

Please refer to full WWKS 2+ specification. For digital shelves, usually the device establishes the connection.

Connection establishment by the device



```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <HelloRequest Id="1">
    <Subscriber Id="431" Type="OTCDisplay" Manufacturer="DigitalVendor"
      ProductInfo="MegaShelf" VersionInfo="1.4.0">
      <Capability Name="ItemDisplay"/>
      <Capability Name="StockQuery"/>
      <Capability Name="ArticleSelection"/>
      <Capability Name="LivePriceUpdate"/>
    </Subscriber>
  </HelloRequest>
</WWKS>
  
```

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <HelloResponse Id="1">
  
```

```

<Subscriber Id="100" Type="WMS" Manufacturer="WMSVendor"
ProductInfo="SuperPIS" VersionInfo="1.3">
  <Capability Name="ItemDisplay"/>
  <Capability Name="ArticleSelection"/>
  <Capability Name="LivePriceUpdate"/>
</Subscriber>
</HelloResponse>
</WWKS>

```

Multiple devices sharing a socket connection

It is generally allowed to connect several devices of a homogeneous group to the PIS via the same socket connection.

In such a case, the `HelloResponse` (or `HelloRequest` if the connection is established by the device) contains several subscriber elements, each of which describes a connected device.

Device groups that have to be configured differently on the PIS side or are integrated in workflows in different ways should use separate connections to the PIS.

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <HelloRequest Id="1">
    <Subscriber Id="431" Type="OTCDisplay" Manufacturer="DigitalVendor"
      ProductInfo="MegaShelf" VersionInfo="1.4.0">
      <Capability Name="ItemDisplay"/>
      <Capability Name="StockQuery"/>
      <Capability Name="ArticleSelection"/>
      <Capability Name="LivePriceUpdate"/>
    </Subscriber>
    <Subscriber Id="432" Type="OTCDisplay" Manufacturer="DigitalVendor"
      ProductInfo="MegaShelf" VersionInfo="1.2.0">
      <Capability Name="ItemDisplay"/>
      <Capability Name="ArticleSelection"/>
      <Capability Name="LivePriceUpdate"/>
    </Subscriber>
  </HelloRequest>
</WWKS>

```

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <HelloResponse Id="1">
    <Subscriber Id="100" Type="WMS" Manufacturer="WMSVendor"
      ProductInfo="SuperPIS" VersionInfo="1.3">
      <Capability Name="ShoppingCarts"/>
      <Capability Name="ShoppingCartDelivery"/>
      <Capability Name="ShoppingCartPayment"/>
    </Subscriber>
  </HelloResponse>
</WWKS>

```



```
</HelloResponse>  
</WWKS>
```

Redundant PIS connections

In case of a failure of a PIS server, the PIS may switch to an alternative server and establish a new connection to the device if it acts as client in the WWKS 2+ connection.

If the PIS acts as server in the WWKS 2+ connection, the WWKS 2+ protocol does not define any failure procedure.

Insufficient capabilities

If the list of capabilities transmitted in `HelloRequest` or `HelloResponse` is not sufficient for the respective opposing side, it terminates the socket connection.

There is no notification of the reason for the connection termination via WWKS 2+. Instead, the respective system informs the user about the missing capabilities via a user message and a log entry. The user contacts the manufacturer of the other side and informs it of the error message.

Adaptation of abilities in the HelloResponse

The server may adapt the list of capabilities it transmits in the `HelloResponse` to the capabilities sent by the client in the `HelloRequest`, if this is helpful for clarifying the use cases used.

Device number already in use

If the device number specified by the device in the `Subscriber.ID` is already in use, the PIS terminates the socket connection.

There is no notification of the reason for the connection termination via WWKS 2+. Instead, the PIS informs the user about a user message and a log entry about the colliding device number. The user contacts the manufacturer of the device and informs them about the error message.

Maximum reaction times

Processing step	Maximum Duration	Reaction of other side if no message is sent in time
Connection establishment until sending <code>HelloRequest</code>	5s	Terminates socket connection
Receipt of <code>HelloRequest</code> until sending <code>HelloResponse</code>	5s	Terminates socket connection

7.2 System state

Please refer to full WWKS 2+ specification, currently not specified for digital shelves.

7.3 Item master data

Please refer to full WWKS 2+ specification, currently not specified for digital shelves.

7.3.1 Query item master data.

To be worked out. Please refer to `ArticleInfoRequest/-Response` message description.

7.4 Prices

WWKS 2+ assumes that the PIS manages multiple price categories that define the item price currently valid in different environments.

The actual price determination within the PIS is not relevant for the WWKS 2+ interface. Only prices that are displayed or used in a specific context are exchanged via the interface.

Prices that are valid just for specific customers or customer groups are usually handled in the context of a shopping cart and are not in scope of the use cases in this chapter.

WWKS 2+ predefines just a few price categories that have a specific meaning in the context of the interface. The PIS may define and transmit additional categories.

Price category	Meaning
RRP	Recommended Retail Price or list price as defined by the manufacturer.
Standard	Default price in the pharmacy usually displayed on a price label visible to customers in the pharmacy.
Offer	Current offer price that differs from the standard price.
Loyalty	Special price for a customer group.

7.4.1 Query current price

Purpose

A device may query for one or multiple items the price(s) currently valid from the PIS. Discounts specific to sales transaction context (e.g. for specific customer groups) are not considered.

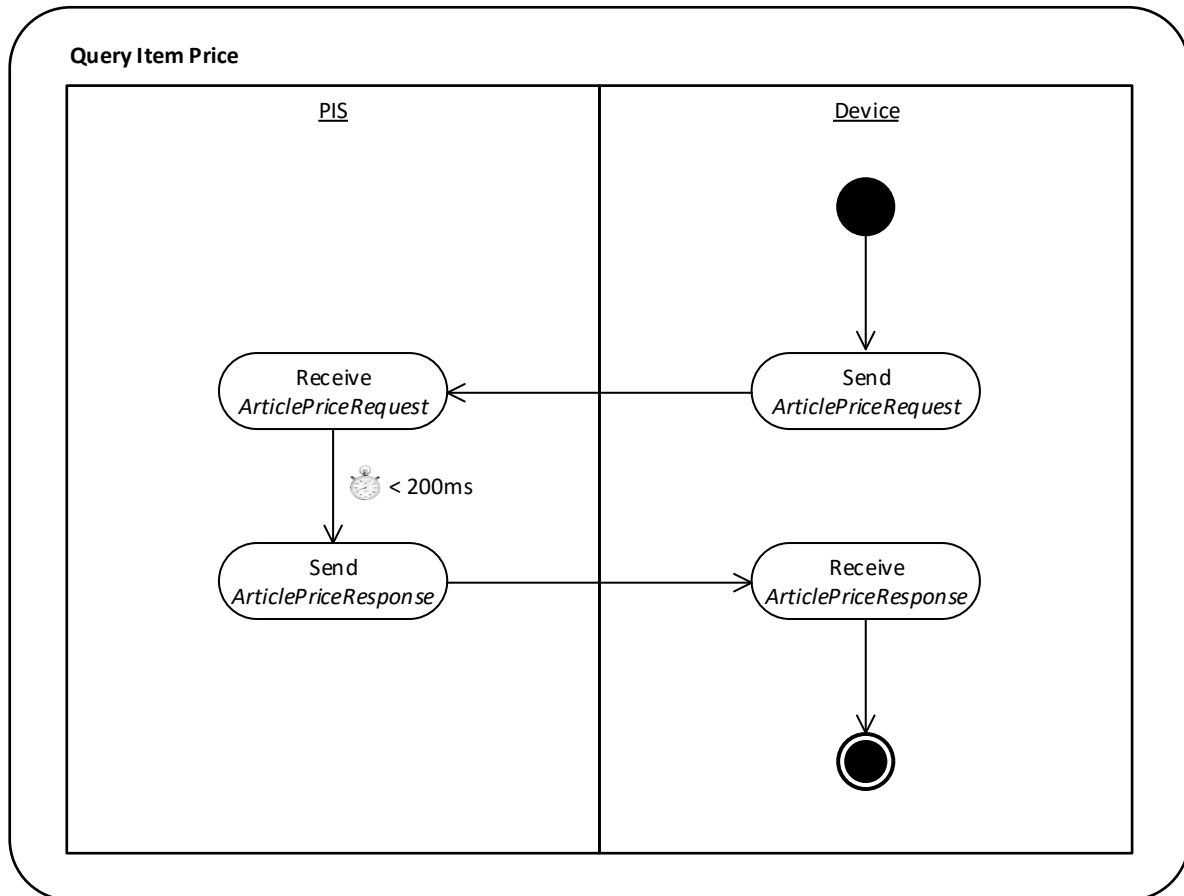
The device uses this query to check the current price of an item before it displays price information of an item to a customer.

Alternatives

For regular transfer of prices for all items, the PIS may send `ArticleMasterSetRequests` to the devices.

This alternative is currently not supported by Rowa Devices.

Default procedure



Query price for single article

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticlePriceRequest Id="1101" Source="801" Destination="100"
    Currency="EUR">
    <Criteria ArticleId="1234"/>
  </ArticlePriceRequest>
</WWKS>
  
```

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticlePriceResponse Id="1101" Source="100" Destination="801"
    Currency="EUR">
    <Article ArticleId="1234">
      <PriceInformation Category="Standard" Description="Normalpreis"
        Quantity="1" Price="20.00" BasePrice="10.00"
        BasePriceUnit="100ml" VAT="19"/>
      <PriceInformation Category="Offer" Description="3For2 Sale"
  
```

```

        Quantity="3" Price="40.00" BasePrice="6.66"
        BasePriceUnit="100ml" VAT="19"/>
    </Article>
</ArticlePriceResponse>
</WWKS>

```

Query prices of multiple articles

Querying multiple prices at once should be used to update price data for all articles that a device shows on the same page. It should not be used to query many articles to prevent overload of the PIS.

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticlePriceRequest Id="1102" Source="801" Destination="100"
    Currency="EUR">
    <Criteria ArticleId="1234"/>
    <Criteria ArticleId="4712"/>
  </ArticlePriceRequest>
</WWKS>

```

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticlePriceResponse Id="1102" Source="100" Destination="801"
    Currency="EUR">
    <Article ArticleId="1234">
      <PriceInformation Category="Standard" Description="Normalpreis"
        Quantity="1" Price="20.00" BasePrice="10.00"
        BasePriceUnit="100ml" VAT="19"/>
      <PriceInformation Category="Offer" Description="3For2 Sale"
        Quantity="3" Price="40.00" BasePrice="6.66"
        BasePriceUnit="100ml" VAT="19"/>
    </Article>
    <Article ArticleId="4712">
      <PriceInformation Category="Standard" Description="Normalpreis"
        Quantity="1" Price="7.95" BasePrice="0.265"
        BasePriceUnit="1 Tablet" VAT="19"/>
      <PriceInformation Category="Offer" Description="3For2 Sale"
        Quantity="3" Price="15.90" BasePrice="0.177"
        BasePriceUnit="1 Tablet" VAT="19"/>
    </Article>
  </ArticlePriceResponse>
</WWKS>

```

Query price of an unknown article

In case the `ArticlePriceRequest` contains an unknown article number, the PIS will not return an article element for this number in the `ArticlePriceResponse`.

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticlePriceRequest Id="1102" Source="801" Destination="100"
    Currency="EUR">
    <Article Id="1234"/>
    <Article Id="0000"/> <!-- unknown item id --> </ArticlePriceRequest>
  </WWKS>
```

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticlePriceResponse Id="1101" Source="100" Destination="801"
    Currency="EUR">
    <Article ArticleId="1234">
      <PriceInformation Category="Standard" Description="Normalpreis"
        Quantity="1" Price="2000" BasePrice="1000"
        BasePriceUnit="100ml" VAT="19"/>
      <PriceInformation Category="Offer" Description="3For2 Sale"
        Quantity="3" Price="4000" BasePrice="666"
        BasePriceUnit="100ml" VAT="19"/>
    </Article>
  </ArticlePriceResponse>
</WWKS>
```

Prices with limited period of validity

The `ArticlePriceResponse` always contains prices that are currently valid without any indication how long the price will be valid.

If supported, the PIS sends a notification at the point in time the price changes. For details please refer to chapter 7.4.2 Price change notification.

Maximum reaction times

Processing step	Maximum Duration	Reaction of other side if no message is sent in time
Receiving <code>ArticlePriceRequest</code> until sending <code>ArticlePriceResponse</code>	200ms (up to 100 articles)	Display of old prices or no display of prices

7.4.2 Price change notification

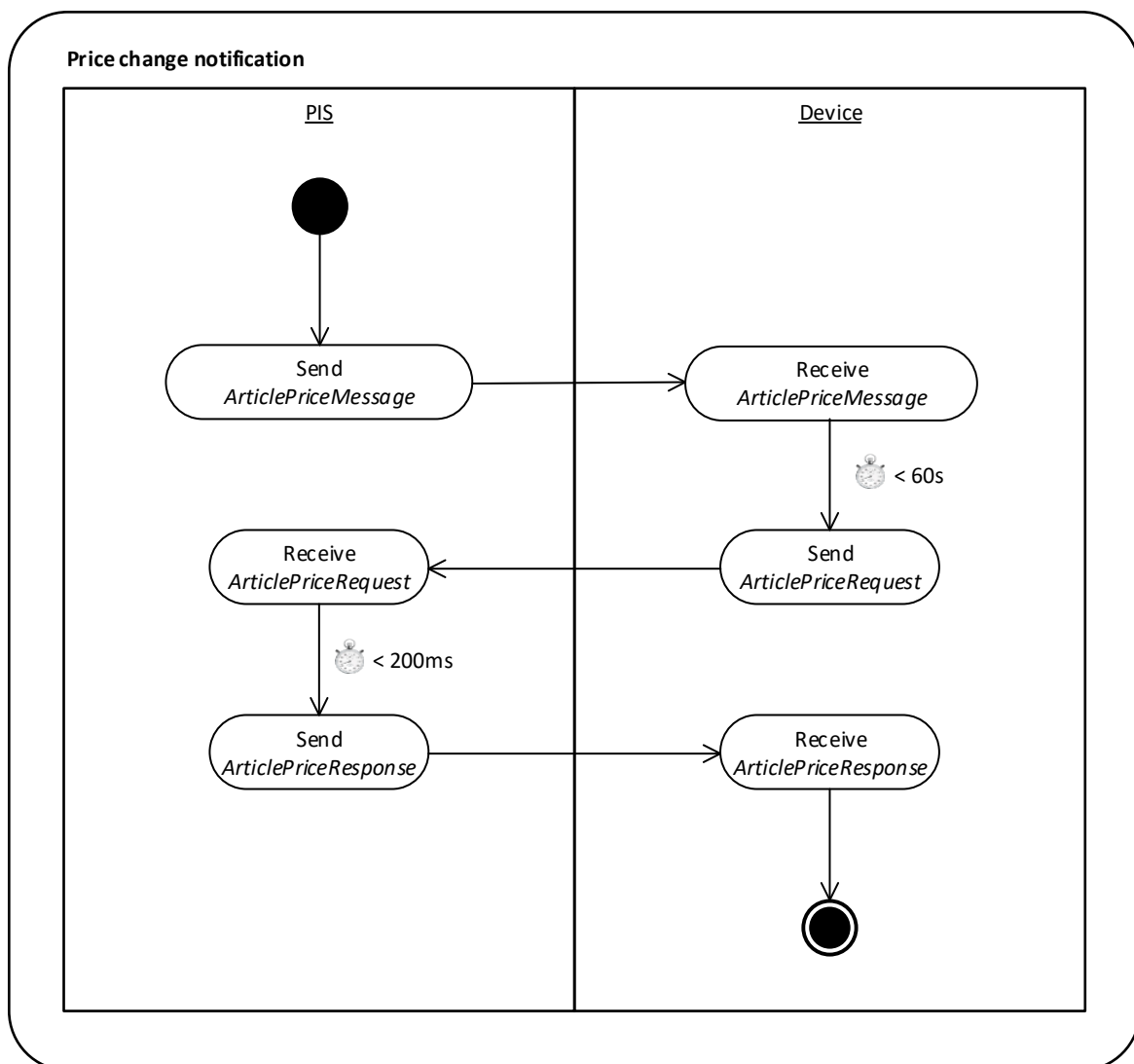
Purpose

Notification by the PIS to connected devices that prices have changed for one or multiple articles.

Default procedure

A device always queries current price data of an article from the PIS before displaying the price data.

To prevent frequent polling by the device just to update the price of an article that is currently displayed, the PIS sends a notification that prices have been changed within the PIS. As this change may affect many articles, the notification does not contain any price details or information which articles are affected. Instead, the devices may react to the notification by querying again the prices for all articles currently displayed.



Example Price Change Notification

```
<WWKS Version="2.0" TimeStamp="2018-04-01T02:00:00Z">  
  <ArticlePriceMessage Id="1101" Source="100" Destination="0"/>  
</ArticlePriceMessage>  
</WWKS>
```

Happy Hours

In case prices are valid just for specific time windows, the PIS sends an `ArticlePriceMessage` at the start and the end of the offer period. The device queries prices for all items currently displays when receiving the notification.

Maximum reaction times

Processing step	Maximum Duration	Reaction of other side if no message is sent in time
Receiving <code>ArticlePriceMessage</code> until querying and display of updated prices by the display.	60s	

7.4.3 Modify prices

Please refer to full WWKS 2+ specification, not required for digital shelves.

7.5 Marketing data

A device may query marketing data from the PIS to display these as additional information to users or customers.

7.5.1 Query article relations

Purpose

Query by a device which other articles or articles variations could be offered in addition to a given article.

The device specifies the type or relation in the request. Some relation types are predefined in WWKS2+, further types may be negotiated by PIS and device vendors.

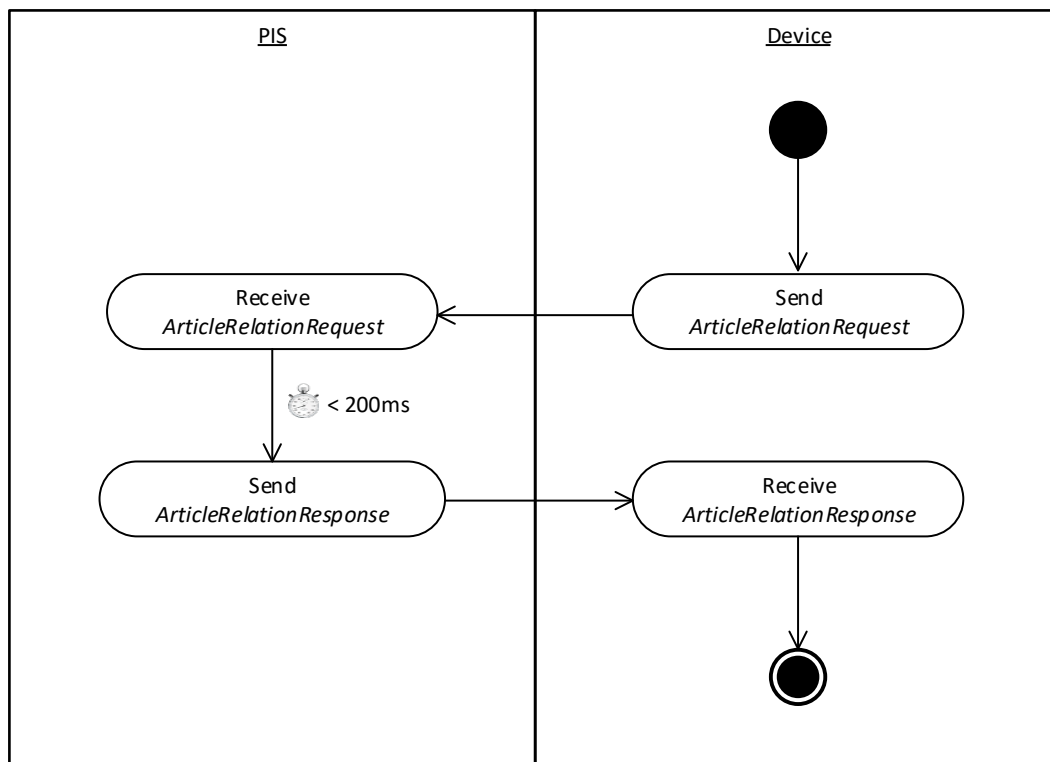
ArticleRelation.Type	Meaning
CrossSelling	Article that could be offered <i>in addition to</i> an article given.
Alternative	Article that could be used <i>instead of</i> an article given.
AlternativePacksize	Alternative <i>pack sizes</i> of the article given.

Default procedure

The device queries the known relations of a specific type for one or multiple articles from the PIS. The PIS answers with a list of article id's that have the request relation to the article id given.

The `ArticleRelationResponse` contains only article ids. In case the device needs further information about the related articles, it has to query them with dedicated requests, e.g. `ArticleInfoRequest` or `ArticlePriceRequest`.

Query article relation



Example

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticleRelationRequest Id="1100" Source="803" Destination="100"
    IncludeCrossSellingArticles="True"
    IncludeAlternativeArticles="True">
    <Article Id="1234"/>
    <Article Id="5678"/>
  </ArticleRelationRequest >
</WWKS>
  
```

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticleRelationResponse Id="1100" Source="803" Destination="100">
    <Article Id="1234">
      <ArticleRelation Type="CrossSelling">
        <RelatedArticle Id="4711"/>
        <RelatedArticle Id="4712"/>
      </ArticleRelation>
      <ArticleRelation Type="Alternative">
        <RelatedArticle Id="9214"/>
      </ArticleRelation>
    </Article>
  </ArticleRelationResponse>
</WWKS>
  
```

```
<Article Id="5678">
  <ArticleRelation Type="CrossSelling">
    <RelatedArticle Id="7892"/>
  </ArticleRelation>
  <ArticleRelation Type="Alternative">
  </ArticleRelation>
</Article>
</ArticleRelationResponse>
</WWKS>
```

Maximum reaction times

Processing step	Maximum Duration	Reaction of other side if no message is sent in time
Receiving ArticleRelationRequest until sending ArticleRelationResponse	200ms	No relation displayed.

7.5.2 Query pharmaceutical details

E.g. information text or package leaflet. *To be defined.*

7.6 Storage

Please refer to full WWKS 2+ specification, not required for digital shelves.

7.6.1 Query stock

The PIS may query the stock currently stored in a picking robot as well as a device may query the current stock inside the pharmacy.

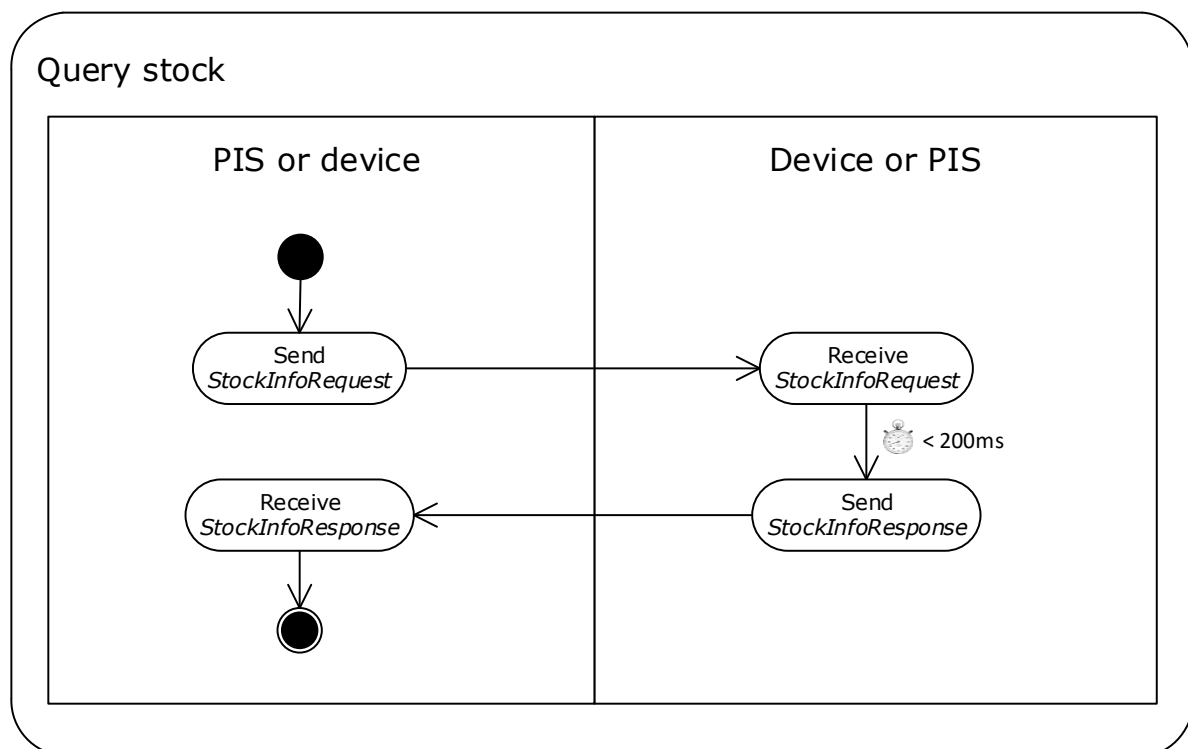
Messages used: *StockInfoRequest*, *StockInfoResponse*.

7.6.1.1 Query article stock

Purpose

Query the current stock of one, multiple or all articles.

Default procedure



Example device queries PIS

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <StockInfoRequest Id="2547" Source="801" Destination="100"
    IncludePacks="False">
    <Criteria ArticleId="1234"/>
    <Criteria ArticleId="8745"/>
    <Criteria ArticleId="4455"/>
  </StockInfoRequest>
</WWKS>
  
```

```
</StockInfoRequest>
</WWKS>
```

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <StockInfoResponse Id="2547" Source="100" Destination="801">
    <Article Id="1234" Quantity="3" Availability="Available"/>
    <Article Id="8745" Quantity="0" Availability="Orderable"/>
    <Article Id="4455" Quantity="0" Availability="NotAvailable"/>
  </StockInfoResponse>
</WWKS>
```

Processing step	Maximum Duration	Reaction of other side if no message is sent in time
Receiving StockInfoRequest until sending StockInfoResponse	200ms without pack details 5s with pack details	

7.7 Serial number handling (FMD)

Please refer to full WWKS 2+ specification, not required for digital shelves.

7.8 Check good receipts

Please refer to full WWKS 2+ specification, not required for digital shelves.

7.9 Sales transactions

Deprecated.

The use of sales transactions / shopping carts is deprecated for digital shelves. Please implement 7.9.11 Select Item instead.

The PIS uses sales transactions to manage the current state of a sale and delivery of a shopping cart of one or multiple items to a patient.

The PIS is the owner of the sales transaction at all times. All changes to a sales transaction by a device must be authorized or can be rejected by the PIS. The device must be prepared to deal with any rejection of a sales transaction change.

Business Records

For each relevant modification of the sales transaction, the PIS creates a business recording according to accounting standards. Creation of a business record may lead to cancelation and creation of a new sales transaction. The PIS assures that the identification number of the sales

transaction used in this interface does not change over time. This means that a business record number usually cannot be used as sales transaction identification number.

Devices that fully handle sales transactions internally are out of scope of this interface specification.

Point of sales assigned to a sales transaction

A sales transaction is always assigned to either no or exactly one point of sale (SalesPoint). At a point of sale, just one patient is served at a time. Multiple devices may be available at a point of sale that work on the same sales transaction in parallel.

Typical sales points in the pharmacy are:

- A PIS cash register in combination with one or multiple digital shelves,
- A self-service terminal or cash register,
- A pick-up terminal.

If a patient is served further at another point of sale, the PIS has to explicitly transfer the sales transaction to this point.

A device may be designed to support multiple points of sale, such as a digital display located between two cash registers. In this case, the device must ensure that, for each action that can change a sales transaction, the operator selects for which point of sale, and therefore for which sales transaction, the change is made. The device is therefore always assigned to a maximum of one sales location for a particular point in time, but can switch back and forth between several locations.

This interface uses **shopping carts** to model the data of a sales transaction.

7.9.1 (Deprecated) Request shopping cart

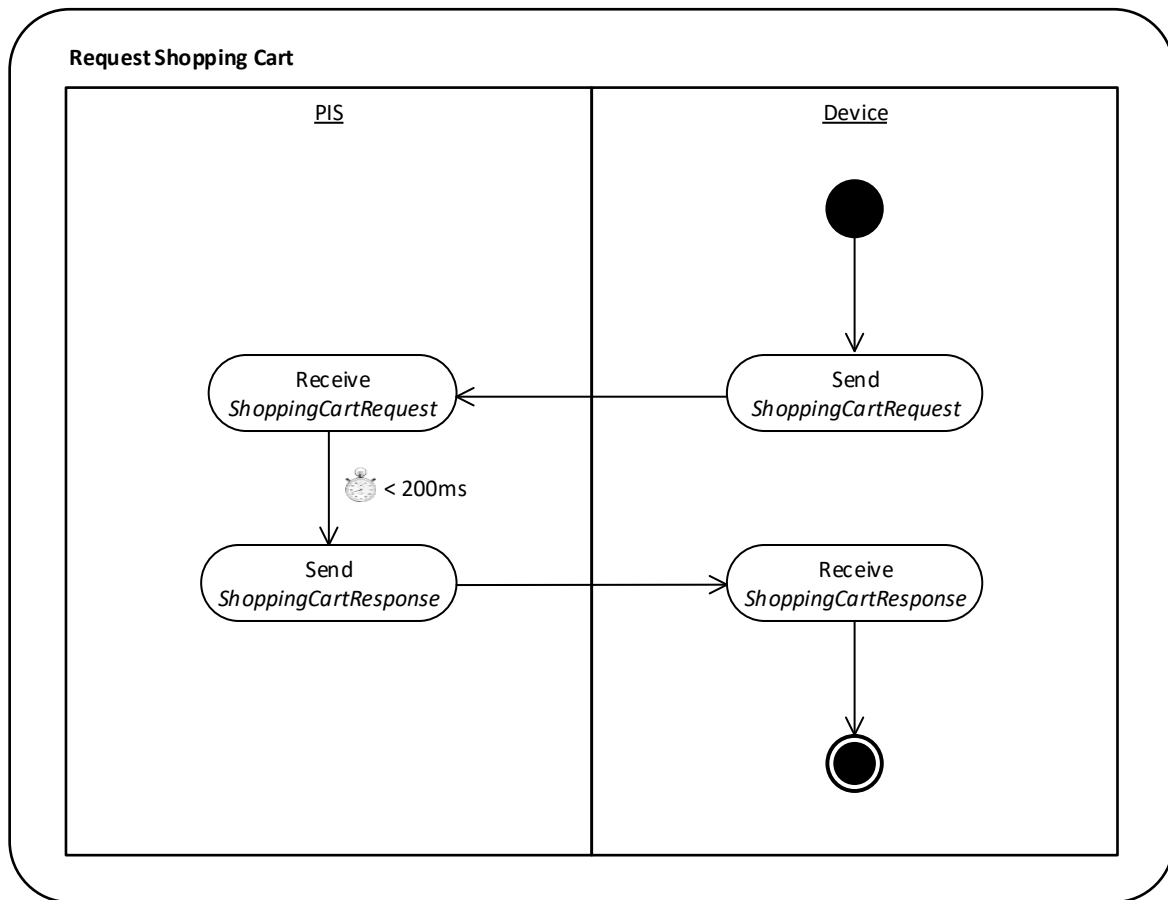
Deprecated.

The use of sales transactions / shopping carts is deprecated for digital shelves. Please implement 7.9.11 Select Item instead.

Purpose

A device can request a shopping cart from the PIS. This can either be empty (for a new sales transaction) or contain information about an existing transaction.

The type of the sales transaction requested depends on the search criteria transmitted for the shopping cart.

Default procedure**Request a new shopping cart**

A device may ask for a new shopping cart by defining no search criteria in the request.

In case the PIS knows to which sales point the Device belongs to, it may already assign the shopping cart to a sales point by setting the `SalesPointId` attribute in the `ShoppingCartResponse`. The device may as well request assignment to its sales point by sending a `ShoppingCartUpdateRequest` for the sales transaction.

```

<WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
  <ShoppingCartRequest Id="1103" Source="701" Destination="100">
  </ShoppingCartRequest>
</WWKS>
  
```

```

<WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
  <ShoppingCartResponse Id="1103" Source="100" Destination="701">
    <ShoppingCart Id="SC-2345" SalesPointId="" Status="Active"/>
  </ShoppingCartResponse>
</WWKS>
  
```

```
</WWKS>
```

Request current shopping cart of a point of sale

A device may query the current shopping cart assigned to a sales point by setting the `SalesPointId` search criteria in the `ShoppingCartRequest`.

In case no shopping cart is currently assigned to the sales point, the PIS returns a new empty shopping cart already assigned to this sales point.

```
<WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
  <ShoppingCartRequest Id="1103" Source="801" Destination="100">
    <Criteria SalesPointId="103"/>
  </ShoppingCartRequest>
</WWKS>
```

```
<WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
  <ShoppingCartResponse Id="1103" Source="100" Destination="801">
    <ShoppingCart Id="SC-2345" SalesPointId="103" Status="Active"
      Currency="EUR">
      <ShoppingCartItem ArticleId="1234" Name="Article-1234"
        OrderedQuantity="2" DispensedQuantity="0" PaidQuantity="0"
        Price="4.95" VAT="19.0"/>
    </ShoppingCart>
  </ShoppingCartResponse>
</WWKS>
```

Request transfer shopping cart to point of sale

A device wants to take over the handling of a shopping cart that is currently assigned to sales point the device does not belong to.

It queries the shopping card with any search criteria known to the device, e.g. customer id, current sales point or the shopping cart id. Afterwards it sends a `ShoppingCartUpdateRequest` with the `SalesPointId` of its own sales point to request the transfer.

The PIS acknowledges the transfer with returning the shopping cart with the `SalesPointId` set to the sales point of the requesting device.

```
<WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
  <ShoppingCartRequest Id="1103" Source="701" Destination="100">
    <Criteria SalesPointId="102"/>
  </ShoppingCartRequest>
</WWKS>
```

```
</WWKS>
```

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartResponse Id="1103" Source="100" Destination="701">
    <ShoppingCart Id="56987" SalesPointId="102" Status="Active"
      Currency="EUR" >
      <ShoppingCartItem ArticleId="1234" Name="Article-1234"
        OrderedQuantity="2" DispensedQuantity="0" PaidQuantity="0"
        Price="4.95" VAT="19.0"/>
    </ShoppingCart>
  </ShoppingCartResponse>
</WWKS>
```

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateRequest Id="1104" Source="701" Destination="100"
    Action="Transfer">
    <ShoppingCart Id="56987" SalesPointId="103" Status="Active"
      Currency="EUR">
      <ShoppingCartItem ArticleId="1234" OrderedQuantity="2"
        DispensedQuantity="0" PaidQuantity="0" Price="4.95"/>
    </ShoppingCart>
  </ShoppingCartUpdateRequest>
</WWKS>
```

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateResponse Id="1104" Source="100" Destination="701"
    Action="Transfer">
    <ShoppingCart Id="56987" SalesPointId="103" Status="Active"
      Currency="EUR">
      <ShoppingCartItem ArticleId="1234" Name="Article-1234"
        OrderedQuantity="2" DispensedQuantity="0" PaidQuantity="0"
        Price="4.95" VAT="19.0"/>
    </ShoppingCart>
  </ShoppingCartUpdateResponse>
</WWKS>
```

In case the search criteria matches to multiple shopping carts, the PIS returns all of them. The device has to be prepared to choose the right shopping cart from the list before sending the ShoppingCartUpdateRequest.

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartRequest Id="1103" Source="701" Destination="100">
    <Criteria CustomerId="8799"/>
  </ShoppingCartRequest>
</WWKS>
```



```
</ShoppingCartRequest>
</WWKS>
```

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartResponse Id="1103" Source="100" Destination="701">
    <ShoppingCart Id="56987" SalesPointId="103" CustomerId="8799"
      Status="Active" Currency="EUR">
      <ShoppingCartItem ArticleId="1234" Name="Article-1234"
        OrderedQuantity="2" DispensedQuantity="0" PaidQuantity="0"
        Price="9.90" VAT="19.0"/>
    </ShoppingCart>
    <ShoppingCart Id="SC-4789" SalesPointId="" CustomerId="8799"
      Status="Active" Currency="EUR">
      <ShoppingCartItem ArticleId="5687" Name="Article-5687"
        OrderedQuantity="1" DispensedQuantity="0" PaidQuantity="0"
        Price="8.90" VAT="19.0"/>
      <ShoppingCartItem ArticleId="3456" Name="Article-3456"
        OrderedQuantity="3" DispensedQuantity="0" PaidQuantity="0"
        Price="17.55" VAT="19.0"/>
    </ShoppingCart>
  </ShoppingCartResponse>
</WWKS>
```

Display language

In case the device supports multiple display languages, it may transmit the current language used by the customer in the request. The PIS may return line item names and descriptions in this language, if supported. In case the PIS does not support multiple languages or the requested language, it will return names and descriptions in its default language.

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartRequest Id="1103" Source="701" Destination="100"
    DisplayLanguage="fr">
  </ShoppingCartRequest>
</WWKS>
```

Query shopping carts using a pick-up code

A device requests all open shopping carts from the PIS that are assigned to a pick-up code by using the `PickupId` search criteria.

The response may contain zero, one or multiple shopping carts.

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartRequest Id="1105" Source="705" Destination="100">
    <Criteria PickupId="PU87345734"/>
  </ShoppingCartRequest>
</WWKS>
```

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartResponse Id="1105" Source="100" Destination="705">
    <ShoppingCart Id="56987" SalesPointId="705" CustomerId="8799"
      PickupId="PU87345734" Status="Active" Currency="EUR">
      <ShoppingCartItem ArticleId="1234" Name="Article-1234"
        OrderedQuantity="2" DispensedQuantity="1" PaidQuantity="2"
        Price="9.90" VAT=19.0"/>
    </ShoppingCart>
    <ShoppingCart Id="SC-4789" SalesPointId="705" CustomerId="8799"
      PickupId="PU87345734" Status="Active">
      <ShoppingCartItem ArticleId="5687" Name="Article-5687"
        OrderedQuantity="1" DispensedQuantity="0" PaidQuantity="1"
        Price="8.90" Currency="EUR" VAT=19.0"/>
      <ShoppingCartItem ArticleId="3456" Name="Article-3456"
        OrderedQuantity="3" DispensedQuantity="0" PaidQuantity="3"
        Price="17.55" VAT=19.0"/>
    </ShoppingCart>
  </ShoppingCartResponse>
</WWKS>
```

Query shopping cart using customer identification attributes

To be defined.

Denial of request by the PIS

The PIS may reject the request by sending an empty response to the device. It may use the `Description` attribute to give a human readable explanation that the device may display to the patient.

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartRequest Id="1103" Source="701" Destination="100">
    <Criteria ShoppingCartId="48779"/>
  </ShoppingCartRequest>
</WWKS>
```

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
```

```
<ShoppingCartResponse Id="1103" Source="100" Destination="701"
  Description="Please talk with a pharmacist."/>
</WWKS>
```

Maximum reaction times

Processing step	Maximum Duration	Reaction of other side if no message is sent in time
Receipt of ShoppingCartRequest/ ShoppingCartUpdateRequest until sending Response	200ms	Assumption that request wasn't granted.

7.9.2 (Deprecated) Modify shopping cart

Deprecated.

The use of sales transactions / shopping carts is deprecated for digital shelves. Please implement 7.9.11 Select Item instead.

Purpose

A device asks the PIS to modify an existing shopping cart according to its request.

Default procedure

There different possible types of modifications. The device specifies the type of the modification by adding an update request element to the `ShoppingCartUpdateRequest`.

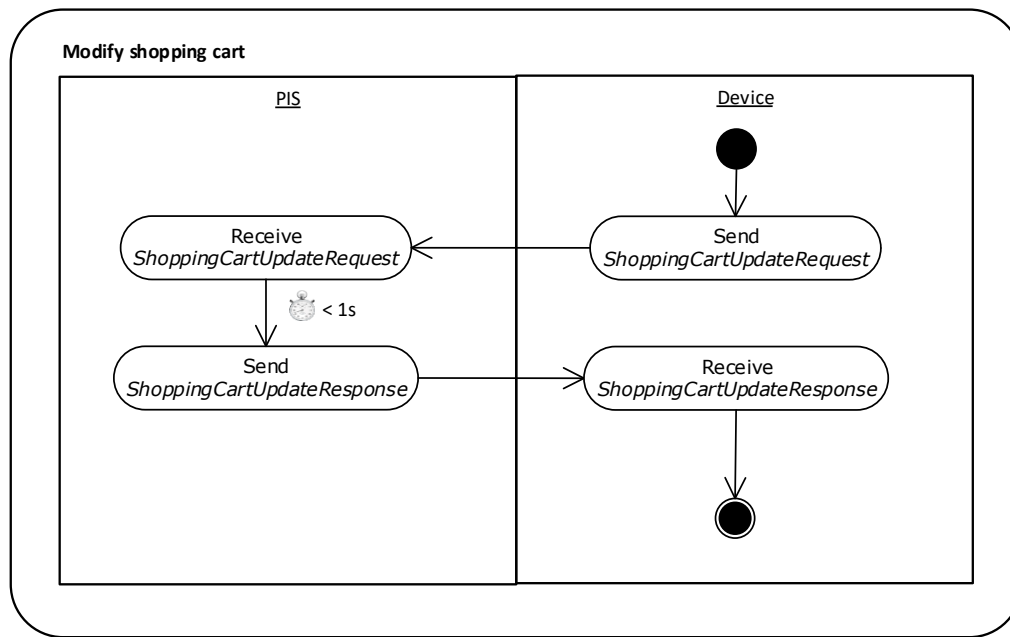
In case the IT system accepts the request, it returns the modified shopping cart.

To simplify error analysis, the device provides its view of the updated shopping cart in the request as well. The IT system usually ignores the shopping cart provided by the device and updates the cart based on its local state. If the IT system does not hold a local state of the shopping cart, it may return the shopping cart provided by the device to accept the request.

Update element	Shopping Cart Modification	Shopping Cart elements that might be changed	Used by Rowa device
BarcodeScanned	Barcode scanned (see use case 7.9.3 Scan barcode for shopping card)	None	Self-Checkout
Delivery	Handing over items to customer	<code>ShoppingCartItem.DispensedQuantity</code>	Pick-up

Add	Add lines	ShoppingCartItem elements added	
ChangeQuantity	Add or remove lines	ShoppingCartItem elements removed or OrderedQuantity changed	Self-Checkout
Payment	Customer has paid the shopping cart fully or partially	ShoppingCartItem.PaidQuantity (deprectated) ShoppingCart.PaymentItem	Self-Checkout
Payment Request	Request to the PIS to handle payment of the shopping cart	None	Self-Checkout
Transfer	Finish handling of shopping cart at a device or move shopping cart to another sales point	SalesPointId	Self-Checkout, Pick-up, Vmotion
CartUpdate	Take over full shopping cart as defined by the device. Provided for backwards compability for IT systems that do not handle the update element		Pick-up

In its answer, the PIS tells the device if it has accepted the modification request and returns the updated shopping cart. The shopping cart may contain as well other modifications, e.g. updated prices.



Adding a line to the shopping cart

The device sends a `ShoppingCartUpdateRequest` with an `Add` update request element and the shopping cart containing the new line. It is possible to add multiple lines add once.

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateRequest Id="1104" Source="701"
    Destination="100">
    <Add ArticleId="5678" OrderedQuantity="2"/>
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="701">
      <ShoppingCartItem ArticleId="1234" OrderedQuantity="1"/>
      <ShoppingCartItem ArticleId="5678" OrderedQuantity="2"/>
    </ShoppingCart>
  </ShoppingCartUpdateRequest>
</WWKS>
  
```

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateResponse Id="1104" Source="100"
    Destination="701">
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="701"
      Currency="EUR">
      <ShoppingCartItem ArticleId="1234" Name="Article-1234"
        OrderedQuantity="1" DispensedQuantity="0" PaidQuantity="0"
        Price="9.90" VAT=19.0"/>
      <ShoppingCartItem ArticleId="5687" Name="Article-5687"
        OrderedQuantity="2" DispensedQuantity="0" PaidQuantity="0"
        Price="8.90" VAT=19.0"/>
    </ShoppingCart>
  </ShoppingCartUpdateResponse>
</WWKS>
  
```

```
<UpdateResult Status="Updated" />
</ShoppingCartUpdateResponse>
</WWKS>
```

Changing the ordered quantity of a shopping cart line

The device sends a `ShoppingCartUpdateRequest` with update element `ChangeQuantity` and the shopping cart with the modified `OrderedQuantity`.

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateRequest Id="1107" Source="701"
    Destination="100">
    <ChangeQuantity ArticleId="1234" OrderedQuantity="3"/>
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="701">
      <ShoppingCartItem ArticleId="1234" OrderedQuantity="3" .../>
      <ShoppingCartItem ArticleId="5678" OrderedQuantity="2" .../>
    </ShoppingCart>
  </ShoppingCartUpdateRequest>
</WWKS>
```

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateResponse Id="1107" Source="100"
    Destination="701">
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="701">
      <ShoppingCartItem ArticleId="1234" OrderedQuantity="3" .../>
      <ShoppingCartItem ArticleId="5678" OrderedQuantity="2" .../>
    </ShoppingCart>
    <UpdateResult Status="Updated"/>
  </ShoppingCartUpdateResponse>
</WWKS>
```

Remove a line from the shopping cart

The device sends a `ShoppingUpdateCartRequest` with update element `ChangeQuantity` and in which the order quantity of the line item it likes to delete is set to zero.

If the PIS accepts the request, it answers with a shopping cart that no longer contains the line item.

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateRequest Id="1108" Source="701"
    Destination="100">
    <ChangeQuantity ArticleId="1234" OrderedQuantity="0"/>
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="701">
      <ShoppingCartItem ArticleId="1234" OrderedQuantity="0" .../>
      <ShoppingCartItem ArticleId="5678" OrderedQuantity="2" .../>
    </ShoppingCart>
  </ShoppingCartUpdateRequest>
</WWKS>
```

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateResponse Id="1108" Source="100"
    Destination="701">
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="701">
      <ShoppingCartItem ArticleId="5678" OrderedQuantity="2" .../>
    </ShoppingCart>
    <UpdateResult Status="Updated"/>
  </ShoppingCartUpdateResponse>
</WWKS>
```

Partial acceptance of a modification

The WWKS 2+ interface does not support partial acceptance of a modification. In case the PIS is not able to accept all modifications in the request it has to deny the modification.

Denial of the modification

The PIS may deny the modification of the shopping cart requested by the device. In this case it sends a `ShoppingCartUpdateResponse` with `UpdateResult.Status="NotUpdated"` and may give a human readable explanation in `UpdateResult.Description` that the device may show to the customer.

The response contains the current state of the shopping cart without the modification requested. The current state of the shopping cart may be different to what the device assumes to be the last state before the modification and the device has to update its copy of the shopping cart.

In case of a denial the PIS does not send a `ShoppingCartUpdateMessage` to inform other devices.

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateRequest Id="1110" Source="701"
    Destination="100">
    <Add ArticleId="5678" OrderedQuantity="2"/>
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="701">
      <ShoppingCartItem ArticleId="1234" OrderedQuantity="1" .../>
    </ShoppingCart>
  </ShoppingCartUpdateRequest>
</WWKS>
```

```
<ShoppingCartItem ArticleId="5678" OrderedQuantity="2" .../>
</ShoppingCart>
</ShoppingCartUpdateRequest>
</WWKS>
```

```
<WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateResponse Id="1110" Source="100"
    Destination="701" Action="Order">
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="701">
      <ShoppingCartItem ArticleId="5678" OrderedQuantity="2" .../>
    </ShoppingCart>
    <UpdateResult Status="NotUpdated" Description="Item not known"/>
  </ShoppingCartUpdateResponse>
</WWKS>
```

Possible reason for a denial of the modification request by the PIS are:

- Shopping cart id invalid or unknown
- Shopping cart no longer assigned to the sales point (timeout)
- Article id unknown
- Article not available for this device
- No stock
- Not allowed to change ordered quantity, line item is already delivered or paid
- ...

Change of display language

The device informs the PIS that the user has changed the display language of the device and requests to transmit line item names and descriptions in the new language by sending a `ShoppingCartUpdateRequest` with update request element `Language`.

If accepted, the PIS returns the updated shopping cart and changes the `DisplayLanguage` attribute of the shopping cart. If rejected, the PIS returns the unmodified shopping cart.

```
<WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateRequest Id="1110" Source="701"
    Destination="100">
    <Language DisplayLanguage="en"/>
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="701"
      DisplayLanguage="de">
      <ShoppingCartItem ArticleId="1234" Name="Medikament 1234" .../>
    </ShoppingCart>
  </ShoppingCartUpdateRequest>
</WWKS>
```



```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateResponse Id="1110" Source="100"
    Destination="701" Action="Order">
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="701"
      DisplayLanguage="en">
      <ShoppingCartItem ArticleId="1234" Name="Drug 1234" .../>
    </ShoppingCart>
    <UpdateResult Status="Updated"/>
  </ShoppingCartUpdateResponse>
</WWKS>

```

Shopping cart update notification

In case the PIS supports use case 7.9.9 Inform about shopping cart modifications the device asking for a shopping cart modification receives as well a `ShoppingCartUpdateMessage`.

Maximum reaction times

Processing step	Maximum Duration	Reaction of other side if no message is sent in time
Receiving <code>ShoppingCartUpdateRequest</code> until sending <code>ShoppingCartUpdateResponse</code>	1s	Assume that modification has been denied.

7.9.3 Scan barcode for shopping cart

Please refer to full WWKS 2+ specification, not required for digital shelves.

7.9.4 Pick shopping cart

Please refer to full WWKS 2+ specification, not required for digital shelves.

7.9.5 (Deprecated) Terminate handling of shopping cart at a device

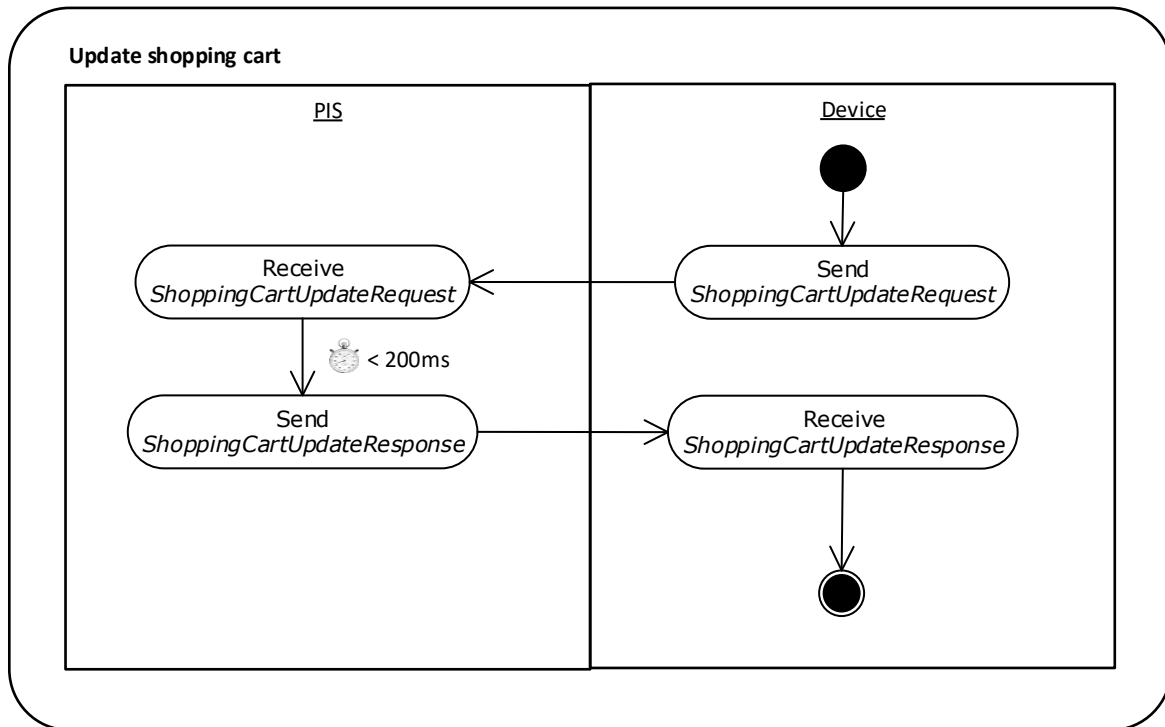
Deprecated.

The use of sales transactions / shopping carts is deprecated for digital shelves. Please implement 7.9.11 Select Item instead.

Purpose

Information by the device to the PIS that it has finished the current action on the sales transaction and will not process it any further now.

Default procedure



To inform the PIS that a device has finished working on the sales transaction, it sends a `ShoppingCartUpdateRequest` with update element `Transfer` and an empty `SalesPointId` to the PIS.

Deprecated: In previous versions of WWKS2+ the device just set an empty `SalesPointId` without providing a `Transfer` update element.

The same or another device may request the shopping cart again at a later point in time (see 7.9.1 (Deprecated) Request shopping cart). Content or state of the transaction may change in the meanwhile.

A rejection of the update request by the PIS does not mean the device has to go on processing the transaction.

Example

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateRequest Id="1110" Source="701"
    Destination="100">
    <Transfer SalesPointId="" />
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="">
      <ShoppingCartItem ArticleId="1234" OrderedQuantity="1" .../>
      <ShoppingCartItem ArticleId="5678" OrderedQuantity="2" .../>
    </ShoppingCart>
  </ShoppingCartUpdateRequest>
</WWKS>
  
```

```

</ShoppingCart>
</ShoppingCartUpdateRequest>
</WWKS>

```

```

<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateResponse Id="1110" Source="100"
    Destination="701" Action="Transfer">
    <ShoppingCart Id="SC-2345" Status="Finished" SalesPointId="">
      <ShoppingCartItem ArticleId="5678" OrderedQuantity="2" .../>
    </ShoppingCart>
    <UpdateResult Status="Updated"/>
  </ShoppingCartUpdateResponse>
</WWKS>

```

Maximum reaction times

Processing step	Maximum Duration	Reaction of other side if no message is sent in time
Sending ShoppingCartUpdateRequest until receipt of ShoppingCartUpdateResponse	200ms	none

7.9.6 Pay shopping cart

Please refer to full WWKS 2+ specification, not required for digital shelves.

7.9.7 Deliver shopping cart to patient

Please refer to full WWKS 2+ specification, not required for digital shelves.

7.9.8 Transfer shopping cart to another sales point

To be defined

7.9.9 Inform about shopping cart modifications (Deprecated)

Deprecated.

The use of sales transactions / shopping carts is deprecated for digital shelves.

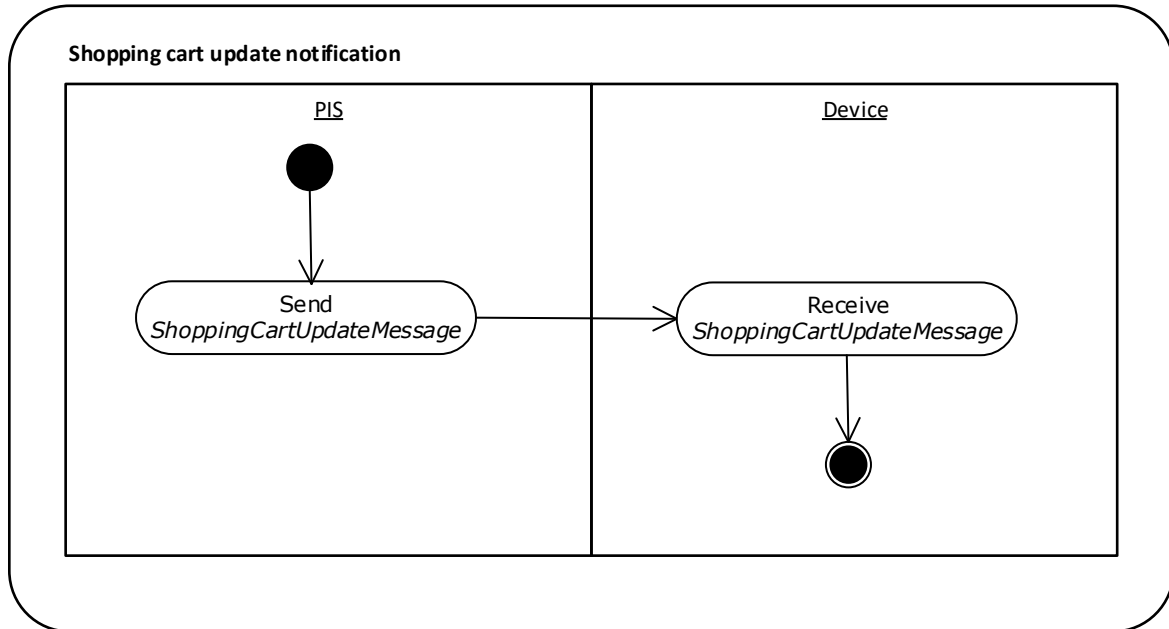
Purpose

The PIS informs all connected device about changes in a sales transaction.

In case a device belongs to the sales point the shopping cart is currently assigned to, it updates its copy of the shopping cart with the content announced by the PIS and updates its display.

Other devices may use the information to switch their content to something that better fits to the shopping cart currently in operation at other sales points.

Default procedure



The PIS sends a *ShoppingCartUpdateMessage* with the current content of the shopping cart whenever the shopping cart has changed. This includes changes of the associated sales point, customer data and other attributes not part of a line item.

The *SalesPointId* attribute defines the current sales point the shopping cart is assigned to. It is empty if no sales point is currently assigned to the shopping cart. A device uses this attribute to check if it has to handle this message or not.

Example

```

<WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateMessage Id="17632" Source="100" Destination="0">
    <ShoppingCart Id="SC-2345" Status="Active" SalesPointId="103">
      <ShoppingCartItem ArticleId="1234" Name="Article-1234"
        OrderedQuantity="1" .../>
      <ShoppingCartItem ArticleId="5678" Name="Article-5678"
        OrderedQuantity="2" .../>
    </ShoppingCart>
  </ShoppingCartUpdateMessage>
</WWKS>
  
```

Maximum reaction times

None

7.9.10 Query historic, already closed shopping carts

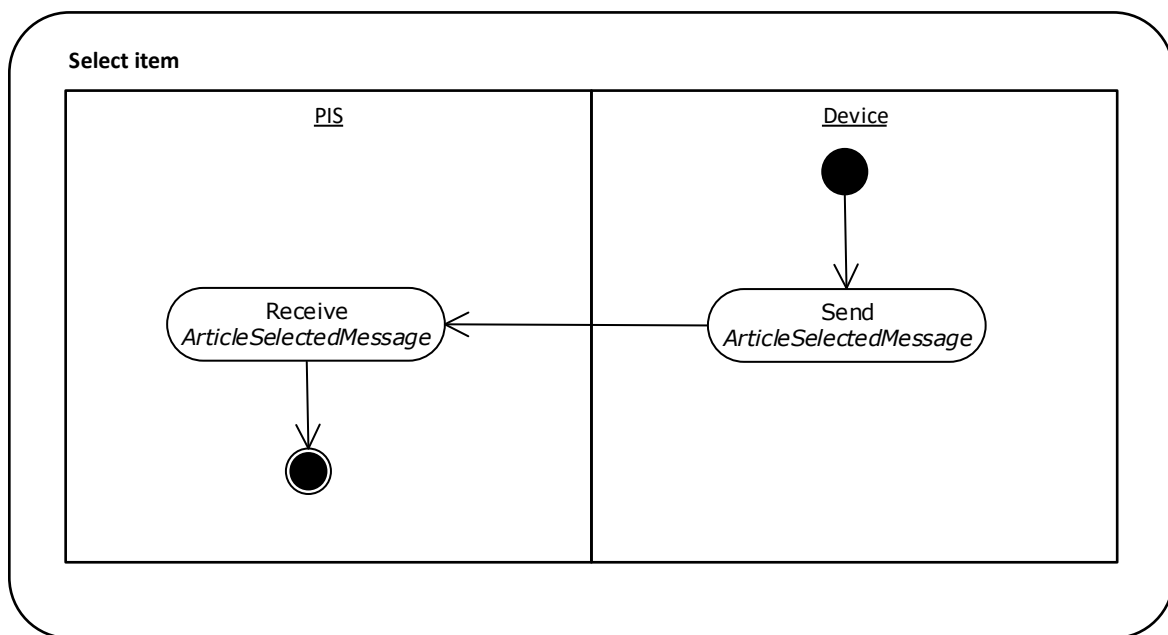
Please refer to full WWKS 2+ specification, not required for digital shelves.

7.9.11 Select item**Purpose**

A device informs the PIS that a user has selected an item, usually with the intention to add it to the current sales transaction at the sales point the device is linked to.

Differentiation

This message is a lightweight alternative to use case 7.9.2 Modify Shopping Cart in case the device just wants to add items to a shopping cart but does not need knowledge about the current state of the sales transaction.

Default procedure

The device sends an `ArticleSelectedMessage` with the article id and the number of packs that have been selected by the user.

The `SalesPointId` attribute defines the current sales point the device is linked to. The PIS may use this information to identify the sales transaction currently open at the sales point to which the selected articles should be added.

The PIS does not return if it has been able to handle the `ArticleSelectionMessage` successfully.

In case the device needs to know the result of the handling on PIS side, the use case 7.9.2 Modify shopping cart should be used instead.

Example

```
<WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
  <ArticleSelectedMessage Id="1105" Source="334" Destination="999"
    SalesPointId="3">
    <Article Id="1234" Quantity="1"/>
  </ArticleSelectedMessage>
</WWKS>
```

Unknown sales point

In case the device sends no or an unknown `SalesPointId` and the PIS is not able to identify the sales transaction, it may answer with an `UnprocessedMessage` to indicate that it hasn't been able to process the `ArticleSelectedMessage`.

The device will not handle the `UnprocessedMessage`. It just allows technicians to detect improper configuration of the sales point id in the device when checking interface logs.

```
<WWKS Version="2.0" Timestamp="2018-03-14T11:14:01Z">
  <UnprocessedMessage Id="3336" Source="100" Destination="334"
    Reason="DataError" Text="Unknown SalesPointId">
    <Message>
      <![CDATA[
        <WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
          <ArticleSelectedMessage Id="1105" Source="334" Destination="999">
            <Article Id="1234" Quantity="1"/>
          </ArticleSelectedMessage>
        </WWKS>
      ]]>
    </Message>
  </UnprocessedMessage>
</WWKS>
```

Maximum reaction times

None

7.9.12 Shopping cart with item master data

Please refer to full WWKS 2+ specification, not required for digital shelves.

8 Data structures

WWKS2 uses common data structures for all messages.

Most sub-elements and attributes of a data structure are optional, but are mandatory in certain use cases. This is specified in the description of the respective use cases.

If an attribute is not specified, but is expected from the opposite side, then it uses the respective defined default value (see below) of the attribute instead.

8.1 Data types

Messages and data structures use these elemental data types:

Data type	Description															
Tag	XML tag															
String	<p>Character string (corresponding to the data type <i>string</i> of the W3C specification for the XML scheme)</p> <p>The permissible value ranges are defined as follows: <code>#x9 #xA [#x20-#xD7FF] [#xE000-#xFFFD] [#x10000-#x10FFFF]</code> and each Unicode character apart from the surrogate blocks <i>FFFE</i> and <i>FFFF</i>, as specified in the standard ISO/IEC 10646.</p> <p>All control characters (e.g. <code>#x1D</code>) not specified in the ISO standard must be coded with <code>\x00</code>. The zeros represent the respective HEX code. Example: <code>\x1D</code>.</p> <p>These characters must be substituted:</p> <table><tr><td>&</td><td>by</td><td>&amp;</td></tr><tr><td><</td><td>by</td><td>&lt;</td></tr><tr><td>></td><td>by</td><td>&gt;</td></tr><tr><td>"</td><td>by</td><td>&quot;</td></tr><tr><td>'</td><td>by</td><td>&apos;</td></tr></table>	&	by	&	<	by	<	>	by	>	"	by	"	'	by	'
&	by	&														
<	by	<														
>	by	>														
"	by	"														
'	by	'														
String64	A <i>String</i> with a maximum length of 64 characters.															
FormattedString	<p>A <i>String</i> that may contain format information.</p> <table><tr><td>[br]</td><td>New line</td></tr><tr><td>[tab]</td><td>Indent</td></tr><tr><td>[u]</td><td>Start/end underline</td></tr><tr><td>[b]</td><td>Start/end bold text</td></tr><tr><td>[i]</td><td>Start/end italic text</td></tr></table>	[br]	New line	[tab]	Indent	[u]	Start/end underline	[b]	Start/end bold text	[i]	Start/end italic text					
[br]	New line															
[tab]	Indent															
[u]	Start/end underline															
[b]	Start/end bold text															
[i]	Start/end italic text															

	<i>Not supported by Rowa Vmotion yet.</i>
Integer 32-bit	<p>32-bit integer (corresponding to the data type <i>int</i> of the W3C specification for the XML scheme)</p> <p>This data type has a syntax comprising a sequence of integers (<i>#x30-#x39</i>).</p> <p>Thousands separators and decimal points are not allowed.</p> <p>The permitted value range covers the numbers between -2147483648 and 2147483647.</p>
Integer 64-bit	<p>64-bit integer (corresponding to the data type <i>long</i> of the W3C specification for the XML scheme)</p> <p>This data type has a syntax comprising a sequence of integers (<i>#x30-#x39</i>).</p> <p>Thousands separators and decimal points are not allowed.</p> <p>The permitted value range covers the numbers between -9223372036854775808 and 9223372036854775807.</p>
Decimal	<p>Decimal number with any precision (corresponds to the data type <i>float</i> in the W3C specification for the XML schema) with at least 18 significant digits.</p> <p>This data type has a lexical representation consisting of a sequence of integers (<i>#x30-#x39</i>).</p> <p>Thousands of points are not allowed, decimal points are allowed.</p>
Boolean	<p>One of the statements <i>True</i> or <i>False</i>.</p> <p>This is a deviation from standard XML which defines lower case values!</p>
Date	Date in the format YYYY-MM-TT

In case an attribute of a message is defined as optional and it is not send in this message, the recipient uses the default value defined in tables in the following sections. In some use cases different default values might be used, this is noted in the use case description.

In some cases, the types described here are restricted if they are used in attributes (e.g. 32-bit integer > 0). This is noted at the relevant locations.

8.2 Stock

8.2.1 Article

For a list of all article attribute, please refer to full WWKS 2+ specification. This document just lists the attributes relevant for digital shelves.

An article describes the properties of an item sold in the pharmacy that do not or just rarely change.

Structure

```
<Article>
</Article>
```

There are several optional sub-elements for an article, which are described in the following sections

Element	Data type	Description	
Article	Tag	Article information. This element may occur multiple times.	
Attributes	Data Type	Description and values	Default
Id	String64	ID of the item. This can be the barcode on the original manufacturer pack or another value. The PIS defines the content of the article Id.	None
Name	String	Item name	""
DosageForm	String	Dosage form of the item.	""
PackingUnit	String	Packaging unit of the item.	""
RequiresFridge	Boolean	Flag that indicates if the item has to be stored in a cooled environment (2°C - 8°C) ("True").	False
MaxSubItemQuantity	Integer 32-bit >0	Number of unit doses (e.g. tablets, ampules, milliliter) in a full pack of the item. A value of „0“ means that the number is unknown.	0
MachineLocation	String64	Id of the machine that has to be used to store a pack of this article. Used only if the solution consists of multiple picking robots.	„ “

PatientInformationLeaflet	String	Content of the article patient leaflet.	""
Description	FormattedString	Detailed article description for display to a patient on a digital screen or a shop system.	""
Quantity	Integer 32-bit	Number of packs of the items on stock.	0

8.2.1.1 Product-/Barcodes

Transmitting of additional product codes is currently not support by Rowa Vmotion.

An article may have multiple alternative codes which are used on packs of this article to identify the article.

Structure

A product code is always a sub-element of an article.

```
<Article>
  <ProductCode>
</ProductCode>
</Article>
```

Element	Data type	Description	
ProductCode	Tag	Information about alternative article identification code follow. Each product code and the article may be used to identify an article. May appear multiple times.	
Attribute	Data type	Description and values	Default
Code	String64	Additional product code of the article. May be used to identify the article when scanning a pack. Cannot be used to request device actions on the article, e.g. dispensing from a picking robot.	""

8.2.1.2 Prices

An article may have one or multiple prices. The attribute `Category` defines the type of the price and when and how is has to be used.

Structure

A price information is always a sub-element of an article.

```
<Article>
  <PriceInformation>
  </PriceInformation>
</Article>
```

Element	Data type	Description		Handled in ShoppingCart
PriceInformation	Tag	Price information follows. May appear multiple time.		
Attribute	Data type	Description and values	Default	
Category	String	<p>The type of a price.</p> <p>WWKS 2+ defines some standard categories as listed below. The PIS may define and transmit additional categories.</p> <p>„RRP”: recommended retail price of the article manufacturer,</p> <p>„Standard”: default price without discount usually used in the pharmacy. The price that is shown on a price tag in the pharmacy rooms.</p> <p>„Offer”: The currently special offer price. Transmit only if the device shall display the price in an emphasized way, e.g. in a different color or comparing it to the default price.</p> <p>“Member”: price that is valid for a selected customer group only and that is displayed in parallel to standard prices on price tags</p>	„Standard“	SCO
Description	String	Human readable description of the price category.	„“	SCO
Quantity	Integer 32-bit >0	Minimum number of packs in a shopping cart line needed to apply the price.	1	SCO
Price	Decimal >0	The price (including VAT) for one pack of the article.	0.00	SCO
BasePrice	Decimal >0	The price for a defined amount of doses (see BasePriceUnit) of the article. Used to make	0.00	SCO

		different pack sizes comparable and mandatory for price tags in some countries.		
BasePriceUnit	String	The unit for which the base price is defined (e.g. "100 ml")	„"	SCO
VAT	Decimal >0	The value added tax rate that is included in the price.	0.00	SCO
Currency	String	Currency code as defined by ISO 4217 (e.g. „EUR") in which the price is defined. Default value is „", meaning undefined currency.	„"	SCO

8.2.1.3 Tags

Tags are currently not supported by Rowa Vmotion.

An article may be assigned an unlimited number of tags that a device may use to filter or group a list of articles or to trigger special handling actions.

Some tags may have special meanings depending on the context. For details please refer to the use case and message descriptions.

Structure

A tag is always a sub-element of an article.

```
<Article>
  <Tag>
</Tag>
</Article>
```

Element	Data type	Description		Handled by
Tag	Tag	Article tag follows. May appear multiple time.		
Attribute	Data type	Description and values	Default	
Value	String	Tag value. Predefined values, the PIS may transfer additional values: "AgeVerification": Item requires age verification before handing over to customer. "Consultation": Item requires consultation by pharmacy staff before handing over to customer.	"	Self-Checkout Self-Checkout

8.2.1.4 Article Relations

An article of a pharmacy assortment has relations to other assortments.

Structure

An article relation is always a sub-element of an article defining to which other articles it has a relationship.

```

<Article>
  <ArticleRelation>
    <RelatedArticle>
    </RelatedArticle>
  </ArticleRelation>
</Article>

```

Element	Data type	Description	
ArticleRelation	Tag	List of article with a relation to the given article. May appear multiple times.	
Attribute	Data type	Description and values	Default
Id	String64	ID of the article to which the given article has a relation.	
Type	String	Relation type. Possible values:	"

		<p>„CrossSelling“: Articles that are often sold together with the given article.</p> <p>„Alternative“: Articles that may be used instead of the given article.</p> <p>„AlternativePacksize“: Articles with the same content but different packaging size as the given article.</p>	
--	--	--	--

Element	Data type	Description	
RelatedArticle	Tag	Information about the related article follow. May appear multiple times.	
Attribute	Data type	Description and values	Default
Id	String64	ID of the related article.	""

8.2.2 Packs

A pack describes the properties of a single sales unit of an article. It covers only properties that are not already part of the article data structure.

Please refer to full WWKS 2+ specification, not required for digital shelves.

8.3 Good receipt

Please refer to full WWKS 2+ specification, not required for digital shelves.

8.4 (Deprecated) Sales Transaction (Shopping cart)

The support of sales transaction is deprecated for digital shelves.

For a list of all shopping cart elements and attributes, please refer to full WWKS 2+ specification. This document just lists the elements and attributes relevant for digital shelves.

The essential, information-carrying element for sales transactions is the `ShoppingCart`.

It contains the basic information about the sales transaction and a list of items contained in the shopping cart for the transaction. In addition may contain a list of information items that are not related to a line item but should be displayed or printed on the receipt of the transaction.

The current state of the sales transaction is always defined by the pharmacy IT system. The device may just ask for modifications and depend on the IT system to confirm them.

In the case of change requests for sales transactions using the `ShoppingCartUpdateRequest`, only similar changes can be transferred in a request and the type of is transferred in the `Action` attribute. The column "Update Action" of the following tables defines the corresponding update

action for each element of the sales transaction. See 12.2.1 (Deprecated)
ShoppingCartUpdateRequest.

Structure

```
<ShoppingCart>
  <ShoppingCartItem>
  </ShoppingCartItem>
</ShoppingCart>
```

Elements

Element	Data type	Description		Update action
Shopping Cart	Tag	Sales transaction details. This element may occur multiple.		
Attribute	Data type	Description and value	Default	Update action
Id	String64	Id of the shopping cart.	„“	<i>Update by device not possible</i>
Status	String	Current status of the sales transaction. Possible values: "Active", if the order process is ongoing/being processed. „Consultation“, if a consultation is required before the shopping cart may be dispensed to the patient. "Finished", if the sales transaction has been closed for now. It may be reopened at a later point in time. "Discarded", if the order process has been discarded. „NotActive“, if the transaction is currently not available for processing, e.g. because it is assigned to a different point of sale.	„Active“	Transfer
StatusMessage	String	Details of status from the PIS to be displayed to the customer.	„“	
SalesPoint Id	String64	ID of the point of sale where the transaction is currently handled.	„“	Transfer

		Empty, if no point of sale is currently assigned.		
SalesPersonId	String64	ID of the responsible salesperson.	„“	Transfer
CustomerId	String64	ID of the patient.	„“	Transfer
Currency	String	Currency used for this shopping cart. ISO-4217 currency code, e.g. 'EUR'	„“	Payment
DisplayLanguage	String	Display language of the device. ISO-639-1 code, e.g. "en". Empty if undefined.	""	

Element	Data type	Description	Default	Update action
Shopping CartItem	Tag	Details of an item in the shopping cart. This element may occur multiple times.		Order
Attribute	Data type	Description and values		
ArticleId	String64	ID of the line item in the shopping cart. The same id may appear in multiple line items of the shopping cart.	„“	Add
Name	String	Line item name to be displayed within the shopping cart. May differ from article name defined in article master data.	""	No update by device
Description	Formatted Text	Additional information for the line item to be displayed by the device.	""	No update by device
Quantity	Integer 32-bit ≥0	<i>Deprecated. Use OrderedQuantity instead.</i> Number of packs of the article originally ordered by the patient.	0	ChangeQuantity
OrderedQuantity	Integer 32-bit ≥0	Number of packs of the article originally ordered by the patient.	0	ChangeQuantity

Available Quantity	Integer 32-bit ≥0	Number of packs of the article on stock in the pharmacy and available for the patient to collect.	<i>Unlimited</i>	
DispensedQuantity	Integer 32-bit ≥0	Number of packs of the article already dispensed to the patient.	0	Delivery
PaidQuantity	Integer 32-bit ≥0	Deprecated. Number of packs of the article already paid by the patient. Only used if it is possible to tell which packs are covered by a partial payment.	0	Payment
Price	Decimal	The total price of the item line in the shopping cart including value added tax. May deviate from ItemListPrice or ItemOfferPrice.	0.00	
Currency	String	Currency of the line item price in case it deviates of the main currency of the shopping cart. ISO 4217 currency code, e.g. 'EUR'	ShoppingCart.Currency	Payment
VAT	Decimal ≥0	The value added tax rate that is included in the price.	0.0	<i>No update by device</i>
ItemListPrice	Decimal	List price of one unit of the line item that the device may show as additional information.	0.0	<i>No update by device</i>
ItemOfferPrice	Decimal	Current offer price of one unit of the line item that the device may show as additional information.	0.0	<i>No update by device</i>

Example

```
<ShoppingCart Id="SC-2345" SalesPointId="103" Status="Active">
  <ShoppingCartItem ArticleId="Article-1111" Quantity="1"
    DispensedQuantity="0" PaidQuantity="0" Price="4.95" Currency="EUR"/>
  <ShoppingCartItem ArticleId="Article-2222" Quantity="4"
    DispensedQuantity="4" PaidQuantity="4" Price="29.99" Currency="EUR"/>
</ShoppingCart>
```

8.5 Label

Please refer to full WWKS 2+ specification, not required for digital shelves.

8.6 Totes

Please refer to full WWKS 2+ specification, not required for digital shelves.

8.7 Customer

To be defined.

8.8 Stock Location

Please refer to full WWKS 2+ specification, not required for digital shelves.

8.9 Search Criteria

For a full list of criterias please refer to full WWKS2+ specification. This document just lists the criteria required for digital shelves.

Filter element used in requests to reduce the results returned.

Not all attributes have a useful meaning in all requests.

Structure

```
<Criteria>  
</Criteria>
```

Elements

Element	Data type	Description	
Criteria	Tag	Search filters follow. If multiple elements appear, just one of them has to match ("or"). Put multiple attributes into one criteria line if all of them have to match ("and").	
Attribute	Data type	Description and values	Default
ArticleId	String64	Id of the article.	""
SalesPointId	String64	Point of sale id.	""

8.10 Task

Please refer to full WWKS 2+ specification, not required for digital shelves.

8.11 System component (Subscriber)

Description of a participant in a WWKS 2+ communication.

Element	Data type	Description	
Subscriber	Tag	Identification of sender	
Attribute	Data type	Description and values	Default
Id	Integer 32-bit >0	<p>ID of the message sender (here the pharmacy IT system). The ID is used in all further messages to identify their senders and recipients.</p> <p>The ID of the pharmacy IT system is defined in the pharmacy IT system.</p> <p>Possible Values (see 0 Device numbers):</p> <p>100: PIS</p> <p>101..199: PIS device (e.g. cash register)</p> <p>200..999: Device of another vendor</p>	0
Type	String	<p>Type of sending system.</p> <p>Possible values:</p> <p>"IMS": Pharmacy IT system (PIS),</p> <p>„POS“: Cash register,</p> <p>"Robot": ASRS,</p> <p>„Pickup“: Pick-up terminal,</p> <p>„SelfCheckOut“: Self-Service cash register,</p> <p>„OrderTerminal“: Order terminal,</p> <p>„OTCDisplay“: Digital shelf for OTC products,</p> <p>„SelfServiceDisplay“: Self-service digital shelf,</p> <p>„InformationDisplay“: Information display.</p> <p>This value is for information purpose only and describes the main purpose of the device. For device integration just the list of capabilities is relevant.</p>	„“
Manufacturer	String	Name of the manufacturer of the sending system	„“
ProductInfo	String	Product name of the sending system	„“

VersionInfo	String	Product version number of the sending system	„“
DeviceName	String	Human readable name of the device that allows to identify it within the pharmacy (e.g. „Cash register 3“)	„“

9 Message reference I – General messages

Mandatory and optional message elements

The messages descriptions contain only the mandatory and typically useful optional elements of the data structures with their special meaning in the context of the respective message. Additional elements can still always be sent with the message. The recipient will process these as far as possible and useful. If an expected optional element is not sent, the recipient should use the default value defined in the data structure.

Example: Batch numbers (`Pack.BatchNumber`) should be included in the pack data structure whenever information about a pack is transmitted, if supported by the PIS/device and known for the pack. The receiver will process it, if supported and useful for the current workflow step. It will assume an empty batch number if it is not sent.

9.1 Message structure

Each message is embedded in the container element `WWKS`, which is constructed according to this scheme:

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
</WWKS>
```

The element `WWKS` encloses each individual message. All other elements of a message are sub elements of `WWKS`.

For WWKS 2+, the attribute `Version` has the value "2.0". As WWKS 2+ is backward compatible with WWKS 2, it use the same value as WWKS 2.

The attribute `TimeStamp` is a time stamp in extended UTC format (coordinated universal time). The timestamp is for information purpose only and might be used to determine clock differences when analyzing log files.

In each message, `WWKS` is followed by the "lead" element, which determines the message type.

Sample message:

```
<WWKS Version="2.0" TimeStamp="2018-01-02T11:14:01Z">
  <InputRequest Id="1002" Source="999" Destination="100">
    <Article>
      <Pack ScanCode="01479163"/>
    </Article>
  </InputRequest>
</WWKS>
```

In the example, the lead element `InputRequest` determines the message type: stock input request for a pack. `InputRequest` is followed by additional sub elements further specifying the input request.

9.2 Initialization

Device Support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported

Lead elements

HelloRequest

HelloResponse

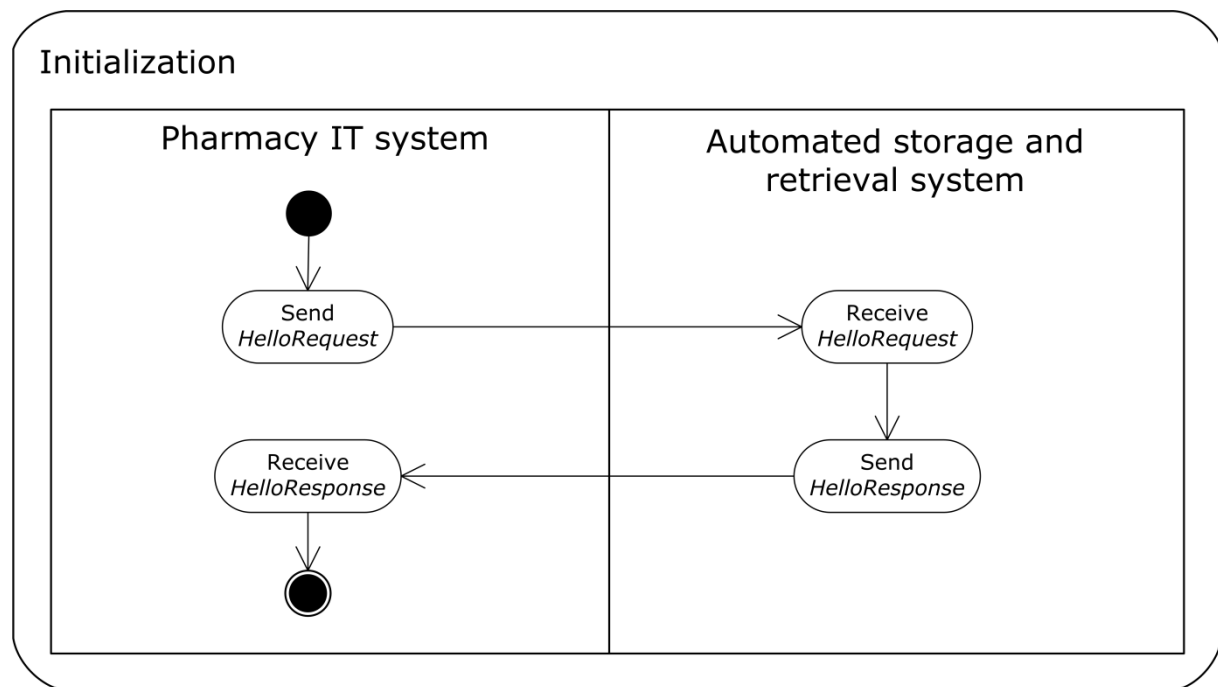
Usage

When the TCP/IP connection between the pharmacy IT system and the automated storage and retrieval system has been established, the client sends the `HelloRequest` once to prepare for the further communications with the communication partner. The server responds with `HelloResponse`. This initializes the connection, readying it for the exchange of further messages.

`HelloRequest` and `HelloResponse` include by a list of supported WWKS capabilities. Both systems thereby indicate which WWKS functions they can process. If there is no listing of supported WWKS capabilities, the receiving system assumes that the sending system supports the capability `"PickingRobot"`.

Optionally, a tenant identifier can be sent in the `HelloRequest`. This identifier is used to distinguish between individual pharmacy IT systems if an automated storage and retrieval system is addressed by several pharmacy IT system at once. All subsequent `Request` messages are then processed in the context of this tenant.

Sequence



9.2.1 HelloRequest

Structure

```

<WWKS>
  <HelloRequest>
    <Subscriber>
      <Capability/>
    </Subscriber>
  </HelloRequest>
</WWKS>

```

Elements

Element	M/O	Data type	Description
HelloRequest	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	Message ID. This is returned in <i>HelloResponse</i> .

Element	M/O	Data type	Description
Subscriber	M	Tag	Identification of sender
Attributes	M/O	Data type	Description and Values
Id	M	Integer 32-bit >0	<p>ID of the message sender (here the pharmacy IT system). The ID is used in all further messages to identify their senders and recipients.</p> <p>The ID of the pharmacy IT system is defined in the pharmacy IT system.</p> <p>Possible Values (see 0 Device numbers):</p> <p>100: PIS</p> <p>101..199: PIS device (e.g. cash register)</p> <p>200..999: Device of another vendor</p>
Type	M	String	<p>Type of sending system.</p> <p>Possible values:</p> <p>"IMS": Pharmacy IT system (PIS),</p> <p>„POS“: Cash register,</p> <p>"Robot": ASRS,</p> <p>„Pickup“: Pick-up terminal,</p> <p>„SelfCheckOut“: Self-Service cash register,</p> <p>„OrderTerminal“: Order terminal,</p> <p>„OTCDisplay“: Digital shelf for OTC products,</p> <p>„SelfServiceDisplay“: Self-service digital shelf,</p> <p>„InformationDisplay“: Information display.</p>
Manufacturer	M	String	Name of the manufacturer of the sending system
ProductInfo	M	String	Product name of the sending system
VersionInfo	M	String	Product version number of the sending system

DeviceName	O	String	Human readable name of the device that allows to identify it within the pharmacy (e.g. „Cash register 3“)
TenantId	O	String	Tenant identifier. Default value is "".

Element	M/O	Data type	Description
Capability	O	Tag	List of supported WWKS 2 functions. This element can be used multiple times.
Attributes	M/O	Data type	Description and Values
Name	M	String	<p>Name of supported WWKS 2+ - capability. For possible values see chapter 6.</p> <p>Defined values for backwards compability with WWKS2, please refer to WWKS 2 spec for details:</p> <p>"KeepAlive"</p> <p>"Status"</p> <p>"Input"</p> <p>"InitiateInput"</p> <p>"ArticleMaster"</p> <p>"StockDelivery"</p> <p>"StockInfo"</p> <p>"Output"</p> <p>"TaskInfo"</p> <p>"TaskCancel"</p> <p>"Configuration"</p> <p>"StockLocationInfo"</p>

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <HelloRequest Id="1001">
    <Subscriber Id="100" Type="OTCDisplay" Manufacturer="DigitalVendor"
      ProductInfo="MegaShelf" VersionInfo="1.4.0">
      <Capability Name="ItemDisplay"/>
      <Capability Name="StockQuery"/>
      <Capability Name="ArticleSelection"/>
      <Capability Name="LivePriceUpdate"/>
    </Subscriber>
  </HelloRequest>
</WWKS>
```

Library

TCP/IP connection setup, including initial sending of the `HelloRequest` and receiving of the `HelloResponse` is implemented by the `Connect` method. A mandatory operator is the computer name, or IP address, of the Rowa system. This automatically connects to port 6050. Example:

```
storageSystem.Connect("192.168.64.6");
```

If an alternative port was specified (here 6053), the connection would look like this:

```
storageSystem.Connect("192.168.64.6", 6053);
```

9.2.2 HelloResponse

Structure

```
<WWKS>
  <HelloResponse>
    <Subscriber>
      <Capability/>
    </Subscriber>
  </HelloResponse>
</WWKS>
```

Elements

Element	M/O	Data type	Description
HelloResponse	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID sent in the <i>HelloRequest</i>

Element	M/O	Data type	Description
Subscriber	M	Tag	Identification of sender
Attributes	M/O	Data type	Description and Values
Id	M	Integer 32-bit >0	<p>ID of the message sender (here the pharmacy IT system). The ID is used in all further messages to identify their senders and recipients.</p> <p>The ID of the pharmacy IT system is defined in the pharmacy IT system.</p> <p>Possible Values (see 0</p>

			Device numbers): 100: PIS 101..199: PIS device (e.g. cash register) 200..999: Device of another vendor
Type	M	String	Type of sending system. Possible values: "IMS": Pharmacy IT system (PIS), „POS": Cash register, "Robot": ASRS, picking robot, „Pickup": Pick-up terminal, „SelfCheckOut": Self-Service cash register, „OrderTerminal": Order terminal, „OTCDisplay": Digital shelf for OTC products, „SelfServiceDisplay": Self-service digital shelf, „InformationDisplay": Information display.
Manufacturer	M	String	Name of the manufacturer of the sending system
ProductInfo	M	String	Product name of the sending system
VersionInfo	M	String	Product version number of the sending system
DeviceName	O	String	Human readable name of the device that allows to identify it within the pharmacy (e.g. „Cash register 3")
TenantId	O	String	Tenant identifier. Default value is "".

Element	M/O	Data type	Description
Capability	O	Tag	List of supported WWKS 2 functions. This element can be used multiple times.
Attributes	M/O	Data type	Description and Values

Name	M	String	<p>Name of supported WWKS 2+ - capability. For possible values see chapter 6.</p> <p>Defined values for backwards comp ability with WWKS2, please refer to WWKS 2 spec for details:</p> <p>"KeepAlive"</p> <p>"Status"</p> <p>"Input"</p> <p>"InitiateInput"</p> <p>"ArticleMaster"</p> <p>"StockDelivery"</p> <p>"StockInfo"</p> <p>"Output"</p> <p>"TaskInfo"</p> <p>"TaskCancel"</p> <p>"Configuration"</p> <p>"StockLocationInfo"</p>
------	---	--------	---

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <HelloResponse Id="1001">
    <Subscriber Id="999" Type="OTCDisplay" Manufacturer="BD Rowa Germany
      GmbH" ProductInfo="Mosaic" VersionInfo="2.0.1">
      <Capability Name="ItemDisplay"/>
      <Capability Name="ArticleSelection"/>
      <Capability Name="LivePriceUpdate"/>
    </Subscriber>
  </HelloResponse>
</WWKS>
```

Library

See *HelloRequest*.

9.3 Keep alive

Device Support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported

Lead elements

KeepAliveRequest

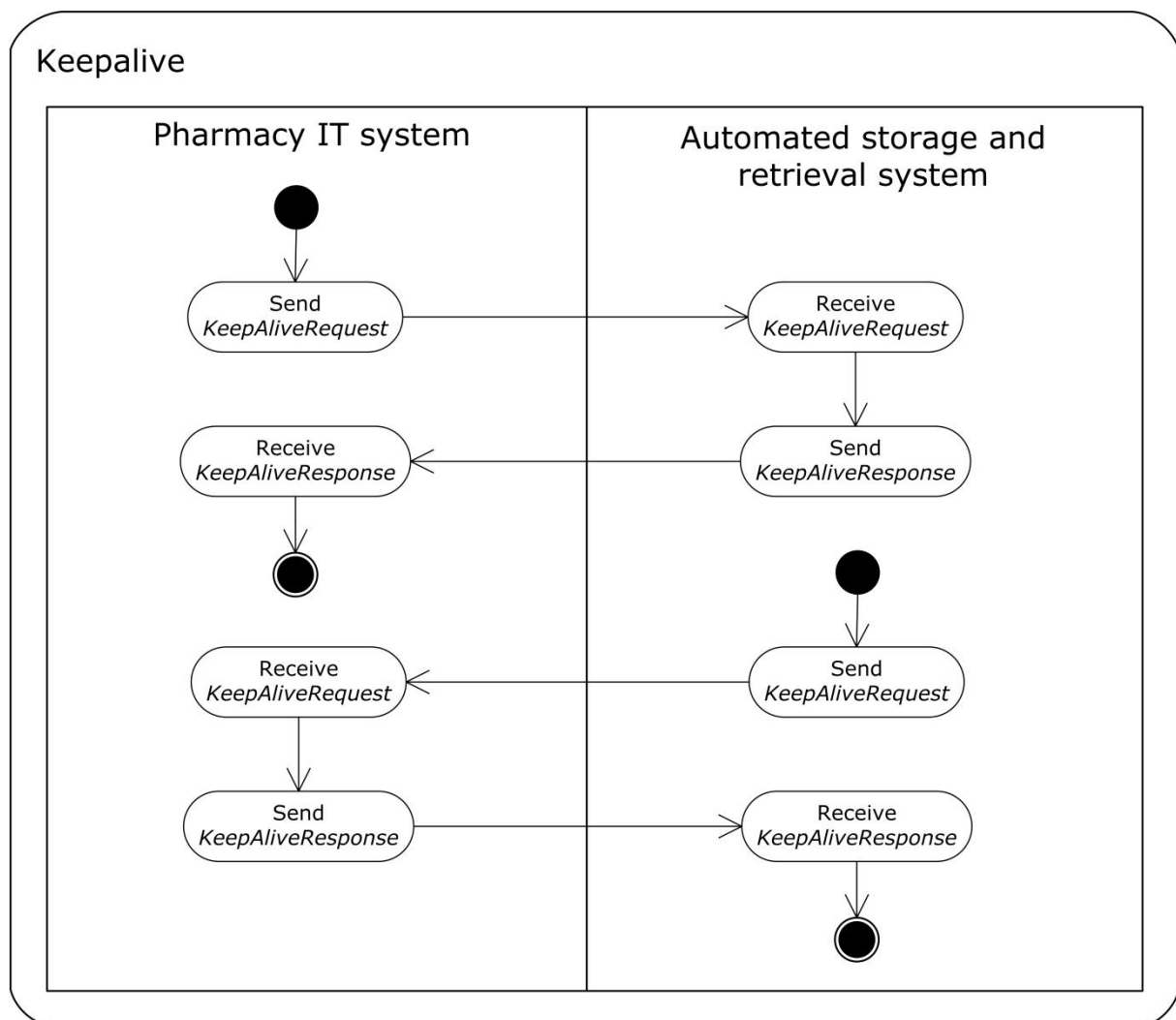
KeepAliveResponse

Usage

A *Keepalive* request can be sent at any time by both systems to check whether the transport channel underlying the connection is still active. This may be useful under the following conditions:

- When the transport channel is potentially unstable (such as with UMTS, GPRS).
- When the network infrastructure being used comprises many active components (e.g. managed switches, routers) and it may be that one of the components has cut the connection.

Sequence



9.3.1 KeepAliveRequest

Structure

```

<WWKS>
  <KeepAliveRequest/>
</WWKS>
  
```

Elements

Element	M/O	Data type	Description
KeepAliveRequest	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	Message ID. This is returned in the <i>KeepAliveResponse</i> .
Source	M	Integer 32-bit >0	ID of the system sending the <i>KeepAliveRequest</i>
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>KeepAliveRequest</i>

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <KeepAliveRequest Id="1003" Source="100" Destination="999"/>
</WWKS>
```

Library

The library responds automatically and transparently to every *KeepAliveRequest* from the automated storage and retrieval system.

The library does not currently support a *KeepAliveRequest* from the pharmacy IT system.

9.3.2 KeepAliveResponse**Structure**

```
<WWKS>
  <KeepAliveResponse/>
</WWKS>
```

Elements

Element	M/O	Data type	Description
KeepAliveResponse	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	Message ID. This is the same as the one sent in the <i>KeepAliveResponse</i> message.

Source	M	Integer 32-bit >0	ID of the system sending the <i>KeepAliveResponse</i>
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>KeepAliveResponse</i>

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">  
  <KeepAliveResponse Id="1003" Source="999" Destination="100"/>  
</WWKS>
```

Library

The library responds automatically and transparently to every *KeepAliveRequest* from the automated storage and retrieval system.

The library does not currently support a *KeepAliveRequest* from the pharmacy IT system.

9.4 Unknown messages

Device Support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	<i>Under development</i>

Lead elements

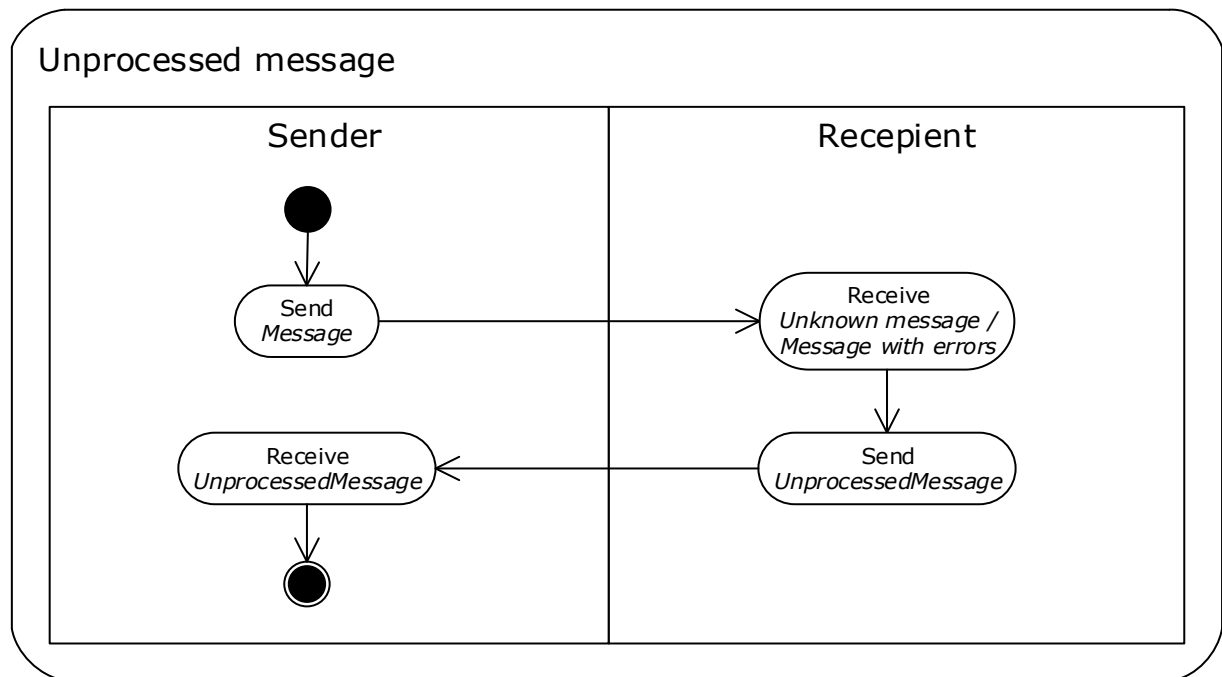
UnprocessedMessage

Usage

If PIS or device receive a message, they cannot understand or process, they may tell the other side about this fact by sending an *UnprocessedMessage*.

The receiver of this message should not process it automatically except writing it into a log file. This log might help analyzing issues when developing the interface integration.

Sequence



9.4.1 UnprocessedMessage

Structure

```

<WWKS>
  <UnprocessedMessage/>
</WWKS>

```

Elements

Element	M/O	Data type	Description
UnprocessedMessage	M	Tag	Message type
Attributes	M/O	Data type	Description and values
Id	M	String64	ID of the message.
Source	M	Integer 32-bit >0	ID of the system component that sends the message.
Destination	P	Integer 32-bit >0	ID of the message destination system component

Reason	O	String	Reason of non-processing the original message. Possible values: "SyntaxError": Invalid XML or other syntactical errors "NotSupported": Receiver does not support this message type. "DataError": Receiver expected additional attributes in the message or received unknown data it was not able to handle. Used only if no specific Response is defined to handle this error.
Text	O	String	Human readable text with additional hints to reason.

Element	M/O	Data type	Description
Message	M	Tag	Information of received but unprocessed message. The message content is embedded as CDATA XML into this element.
Id	O	String64	ID of received message, if detected.

Example

```
<WWKS Version="2.0" TimeStamp="2018-03-14T11:14:01Z">
  <UnprocessedMessage Id="3335" Source="100" Destination="999"
    Reason="SyntaxError" Text="Missing WWKS tag">
    <Message>
      <![CDATA[
        <WWX Version="2.0" TimeStamp="2018-03-14T11:14:00Z">
          <InputRequest Id="1002" Source="999" Destination="100">
            <Article>
              <Pack ScanCode="12156894"/>
            </Article>
          </InputRequest>
        </WWX>
      ]]>
    </Message>
```

```
</UnprocessedMessage>
</WWKS>

<WWKS Version="2.0" TimeStamp="2018-03-14T12:14:01Z">
  <UnprocessedMessage Id="3336" Source="100" Destination="999"
    Reason="NotSupported" Text="Unknown Message ArticlePriceRequest">
    <Message Id="1101">
      <![CDATA[
        <WWKS Version="2.0" TimeStamp="2018-03-14T12:14:00Z">
          <ArticlePriceRequest Id="1101" Source="100" Destination="999"
            Currency="EUR">
            <Article Id="Article-1234"/>
          </ArticlePriceRequest>
        </WWKS>
      ]]>
    </Message>
  </UnprocessedMessage>
</WWKS>
```

Library

The library sends an `UnprocessedMessage` in case it receive a message it cannot process.

It logs all received `UnprocessedMessage`.

10 Message reference II – article data

10.1 Master data

Please refer to full WWKS2+ specification, not required for digital shelves..

10.2 Good receipt

Please refer to full WWKS2+ specification, not required for digital shelves.

10.3 Article Information

Lead elements

`ArticleInfoRequest`

`ArticleInfoResponse`

`ArticlePriceRequest`

`ArticlePriceResponse`

`ArticlePriceMessage`

`ArticleRelationRequest`

`ArticleRelationResponse`

Usage

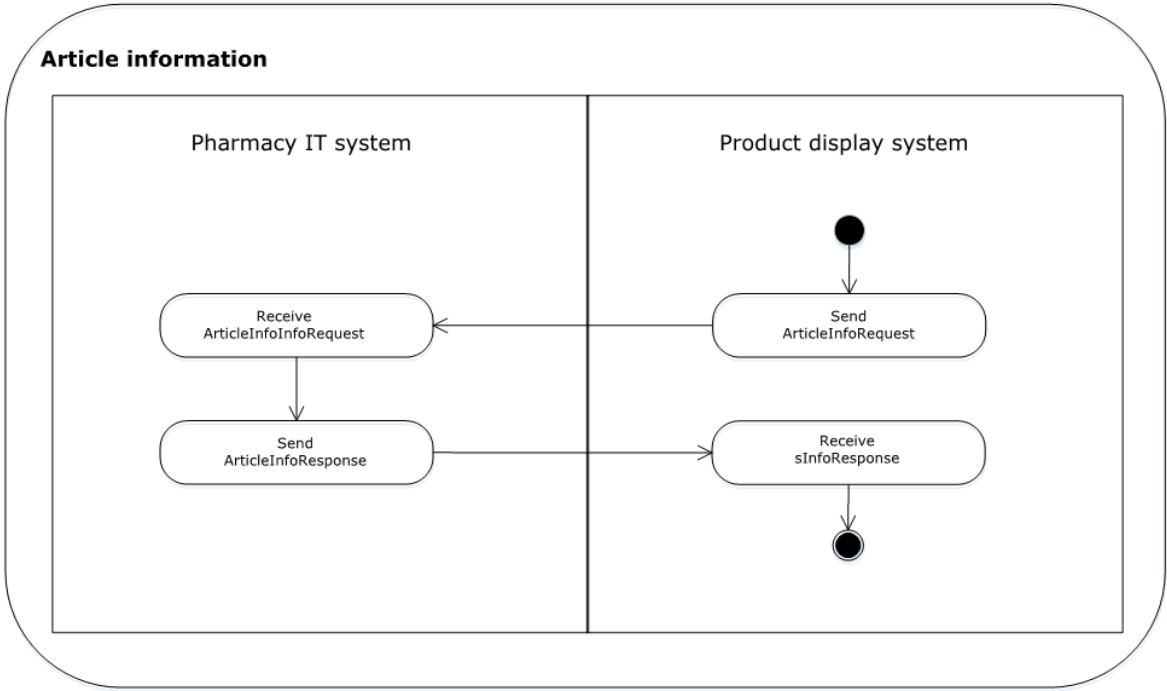
ArticleInfoRequest can be used to request basic information on any article from the pharmacy IT system at any time. The pharmacy IT system responds with a corresponding *ArticleInfoResponse*.

ArticlePriceRequest can be used to request the current article price (including volume prices) from the pharmacy IT system at any time. The pharmacy IT system responds with a corresponding *ArticlePriceResponse*.

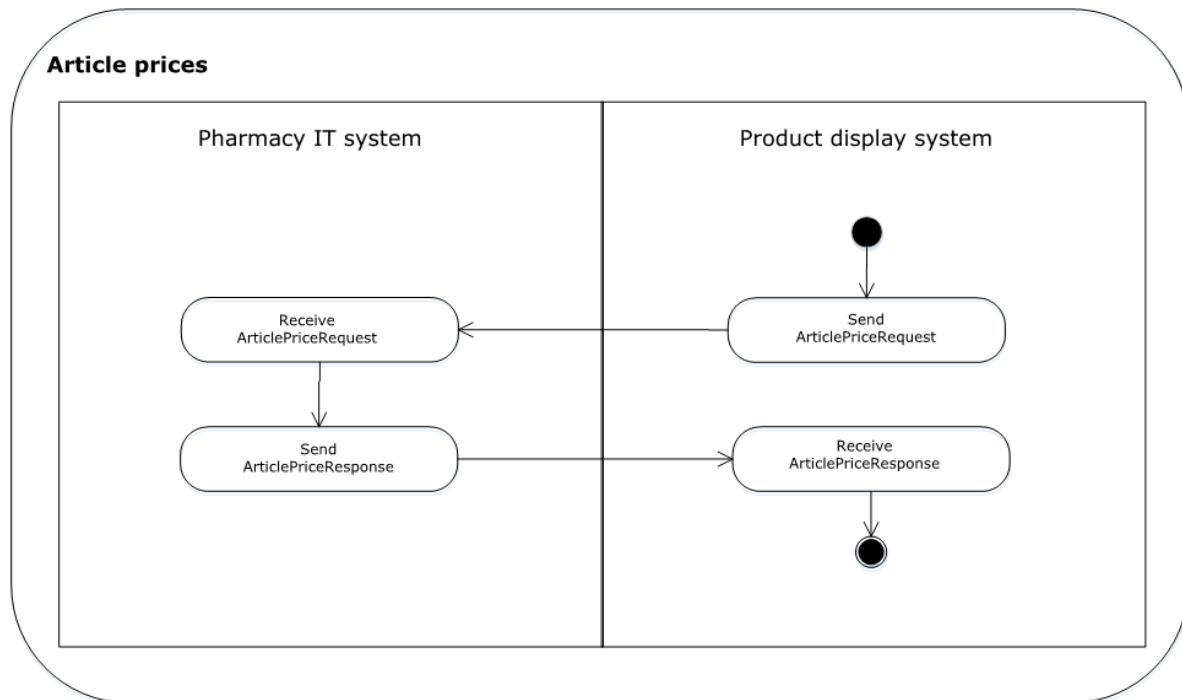
The pharmacy IT system uses an *ArticlePriceMessage* to indicate that prices have changed.

ArticleRelationRequest can be used to query which other articles have a specific relation with a given article. The pharmacy IT system responds with the corresponding *ArticleRelationResponse*.

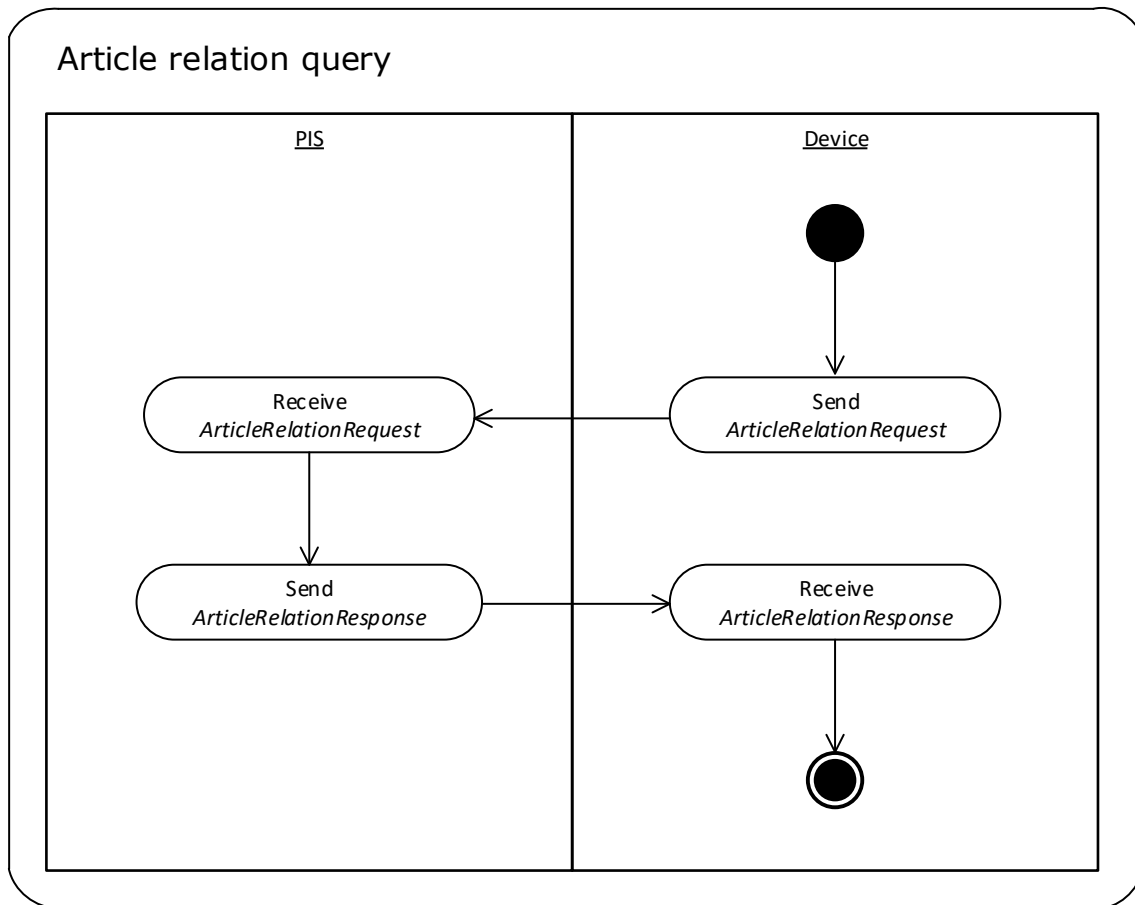
Article information request sequence



Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported

Article price request sequence

Device category	Rowa Device	Message support
ASRS	Rowa Vmax/Select	Not supported
Digital OTC Shelf	Rowa Vmotion	Supported
Pick-up Terminal	Rowa Vpoint Pick-up	Not supported
Self-checkout	Rowa Self-Checkout	<i>Deprecated</i>

Article relation request sequence

Device category	Rowa Device	Message support
ASRS	Rowa Vmax/Select	Not supported
Digital OTC Shelf	Rowa Vmotion	<i>Planned</i>
Pick-up Terminal	Rowa Vpoint Pick-up	Not supported
Self-checkout	Rowa Self-Checkout	Not supported

10.3.1 ArticleInfoRequest

Device support

Device category	Rowa Device	Message support
ASRS	Rowa Vmax/Select	Not supported
Digital OTC Shelf	Rowa Vmotion	Supported
Pick-up Terminal	Rowa Vpoint Pick-up	Not supported
Self-checkout	Rowa Self-Checkout	Supported, deprecated.

Structure

```

<WWKS>
  <ArticleInfoRequest>
    <Article/>
  </ArticleInfoRequest>
</WWKS>

```

Elements

Element	M/O	Data type	Description
ArticleInfoRequest	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article information request. This ID is returned in the <i>ArticleInfoResponse</i> message.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ArticleInfoRequest</i>
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ArticleInfoRequest</i>
IncludeCrossSellingArticles	O	Boolean	<p><i>Deprecated. Use ArticleRelationRequest instead.</i></p> <p>This flag specifies whether cross-selling articles should be included. Possible values: "True" if cross-selling articles are to be sent "False" if no cross-selling articles are to be sent.</p>

			The default value is "False".
IncludeAlternativeArticles	O	Boolean	<p><i>Deprecated. Use Type attribute instead.</i></p> <p>This flag specifies whether alternative articles should be included. Possible values: "True" if alternative articles are to be sent "False" if no alternative articles are to be sent. The default value is "False".</p>
IncludeAlternativePackSizeArticles	O	Boolean	<p><i>Deprecated. Use Type attribute instead.</i></p> <p>This flag specifies whether alternative pack size articles should be included. Possible values: "True" if alternative pack size articles are to be sent "False" if no alternative pack size articles are to be sent. The default value is "False".</p>

Element	M/O	Data type	Description
Article	M	Tag	Article information follows. This element can be used multiple times.
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article.

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticleInfoRequest Id="1100" Source="100" Destination="999">
    <Article Id="Article-1234"/>
  </ArticleInfoRequest>
</WWKS>
```

Library

```
var digitalShelf= new RowaDigitalShelf();

digitalShelf.ArticleInfoRequested += DigitalShelf_ArticleInfoRequested;
```



```
void DigitalShelf_ArticleInfoRequested(IDigitalShelf sender, IArticleInfoRequest
request)
{
    Console.WriteLine(string.Format("Article information for '{0}' articles
has been requested from the digital shelf.", request.Articles.Count()));

    foreach (var article in request.Articles)
    {
        article.SetArticleInformation(article.Id, "Test Name", "dosage
form", "packaging unit", 10);
        article.AddTag("tag");

        // deprecated, use ArticleRelationRequest instead
        if (request.IncludeCrossSellingArticles)
        {
            article.AddCrossSellingArticle("article-111");
        }

        // deprecated, use ArticleRelationRequest instead
        if (request.IncludeAlternativeArticles)
        {
            article.AddAlternativeArticle("article-222");
        }

        // deprecated, use ArticleRelationRequest instead
        if (request.IncludeAlternativePackSizeArticles)
        {
            article.AddAlternativePackSizeArticle("article-333");
        }
    }

    request.Finish();
}
```

10.3.2 ArticleInfoResponse

Device support

Device category	Rowa Device	Message support
ASRS	Rowa Vmax/Select	Not supported
Digital OTC Shelf	Rowa Vmotion	Supported
Pick-up Terminal	Rowa Vpoint Pick-up	Not supported
Self-checkout	Rowa Self-Checkout	Supported, deprecated.

Structure

```
<WWKS>
  <ArticleInfoResponse>
    <Article>
      <Tag/>
    </Article>
  </ArticleInfoResponse>
</WWKS>
```

Deprecated:

```
<WWKS>
  <ArticleInfoResponse>
    <Article/>
    <Tag/>
    <CrossSellingArticles>
      <Article/>
    </CrossSellingArticles>
    <CrossSellingArticles>
      <Article/>
    </CrossSellingArticles>
    <CrossSellingArticles>
      <Article/>
    </CrossSellingArticles>
  </Article>
</ArticleInfoResponse>
</WWKS>
```

Elements

Element	M/O	Data type	Description
---------	-----	-----------	-------------

ArticleInfoResponse	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article information request. This ID was sent in the <i>ArticleInfoRequest</i> message.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ArticleInfoResponse</i> .
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ArticleInfoResponse</i> message.

Element	M/O	Data type	Description
Article	M	Tag	Article information follows. This element may occur multiply.
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article.
Name	O	String	Name of article.
DosageForm	O	String	Dosage form of the article.
PackingUnit	O	String	Packaging unit of the article.
MaxSubItemQuantity	O	Integer 32-bit >=0	Maximum number of units (e.g. pills or ampules) which might be contained in a full pack of the article. The value "0" means that the number of units is unknown.

Element	M/O	Data type	Description
Tag	O	Tag	Article tag follows. This element may occur multiply.
Attributes	M/O	Data type	Description and Values
Value	M	String	The value of the Tag. Samples: "Discrete" or "Profit"

Deprecated Element	M/O	Data type	Description
CrossSellingArticles	O	Tag	The list of Cross Selling Articles follows. This element may occur only once.

Deprecated Element	M/O	Data type	Description
Article	M	Tag	Article information follows. This element may occur multiply.
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article.

Deprecated Element	M/O	Data type	Description
AlternativeArticles	O	Tag	The list of Alternative Articles follows. This element may occur only once.

Deprecated Element	M/O	Data type	Description
Article	M	Tag	Article information follows. This element may occur multiply.
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article.

Deprecated Element	M/O	Data type	Description
AlternativePackSizeArticles	O	Tag	The list of Alternative Pack Size Articles follows. This element may occur only once.

Deprecated Element	M/O	Data type	Description
--------------------	-----	-----------	-------------

Article	M	Tag	Article information follows. This element may occur multiply.
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article.

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticleInfoResponse Id="1100" Source="999" Destination="100">
    <Article Id="1111" Name="Article-1111" MaxSubItemQuantity="100">
      <Tag Value="Discrete"/>
    </Article>
  </ArticleInfoResponse>
</WWKS>
```

10.3.3 ArticleRelationRequest**Device support**

Device category	Rowa Device	Message support
ASRS	Rowa Vmax/Select	Not supported
Digital OTC Shelf	Rowa Vmotion	Not supported
Pick-up Terminal	Rowa Vpoint Pick-up	Not supported
Self-checkout	Rowa Self-Checkout	Not supported

Structure

```
<WWKS>
  <ArticleRelationRequest>
    <Article/>
  </ArticleRelationRequest>
</WWKS>
```

Elements

Element	M/O	Data type	Description
ArticleRelationRequest	M	Tag	Message type
Attributes	M/O	Data type	Description and Values

Id	M	String64	ID of the relation request. This ID will be returned in the <i>ArticleRelationResponse</i> message.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ArticleRelationRequest</i> message
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ArticleRelationResponse</i> message
Type	M	String	Type of the article relation requested. Possible values: „CrossSelling”: Articles that are often sold together with the given article. „Alternative”: Articles that may be used instead of the given article. „AlternativePacksize”: Articles with the same content but different packaging size as the given article.
IncludeCrossSellingArticles	O	Boolean	<i>Deprecated. Use Type attribute instead.</i> This flag specifies whether cross-selling articles should be included. Possible values: "True" if cross-selling articles are to be sent "False" if no cross-selling articles are to be sent. The default value is "False".
IncludeAlternativeArticles	O	Boolean	<i>Deprecated. Use ArticleRelationRequest instead.</i> This flag specifies whether alternative articles should be included. Possible values: "True" if alternative articles are to be sent "False" if no alternative articles are to be sent. The default value is "False".
IncludeAlternativePackSizeArticles	O	Boolean	<i>Deprecated. Use ArticleRelationRequest instead.</i> This flag specifies whether alternative pack size articles should be included.

			<p>Possible values:</p> <p>"True" if alternative pack size articles are to be sent</p> <p>"False" if no alternative pack size articles are to be sent.</p> <p>The default value is "False".</p>
--	--	--	---

Element	M/O	Data type	Description
Article	M	Tag	Information about articles to include in the request follows. May appear multiple times.
Attributes	M/O	Data type	Description and Values
Id	M	String64	Id of the article requested.

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticleRelationRequest Id="1100" Source="803" Destination="100"
    Type="CrossSelling">
    <Article Id="1234"/>
    <Article Id="5678"/>
  </ArticleRelationRequest >
</WWKS>
```

Library

To be defined.

10.3.4 ArticleRelationResponse

Device support

Device category	Rowa Device	Message support
ASRS	Rowa Vmax/Select	Not supported
Digital OTC Shelf	Rowa Vmotion	Not supported
Pick-up Terminal	Rowa Vpoint Pick-up	Not supported
Self-checkout	Rowa Self-Checkout	Not supported

Structure

```

<WWKS>
  <ArticleRelationResponse>
    <ArticleRelation>
      <Article/>
    </ArticleRelation>
  </ArticleRelationResponse>
</WWKS>

```

Elements

Element	M/O	Data type	Description
ArticleRelationResponse	M	Tag	Message Type
Attributes	M/O	Data type	Description and Values
Id	M	String64	ID of the relation request used in the related <i>ArticleRelationResponse</i> message.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ArticleRelationResponse</i> message
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ArticleRelationResponse</i> message

Element	M/O	Data type	Description
Article	M	Tag	Information about an article requested follows. May appear multiple time
Attribute	M/O	Data Type	Description and values
Id	M	String64	ID of the article for which a relation has been requested.

Element	M/O	Data type	Description
ArticleRelation	M	Tag	Information zu Artikelbeziehungen folgt. Dieses Element kann mehrmals verwendet werden.
Attribute	M/O	Data Type	Description and values

Type	M	String	<p>Art der Artikelbeziehung.</p> <p>Mögliche Werte:</p> <p>„CrossSelling“: Artikel die häufig zusammen mit dem angefragten Artikel verkauft werden</p> <p>„Alternative“: Artikel, die statt des angefragten Artikels verwendet werden können</p> <p>„AlternativePacksize“: Artikel mit gleichem Inhalt, aber anderer Verpackungseinheit als der angefragte Artikel.</p>
------	---	--------	---

Element	M/O	Data type	Description
RelatedArticle	M	Tag	Artikelinformation des Bezugsartikels folgt. Dieses Element kann mehrmals verwendet werden.
Attribute	M/O	Data Type	Description and values
Id	M	String64	ID of a related article.

Example

```

<WWKS Version="2.0" Timestamp="2013-04-16T11:14:00Z">
  <ArticleRelationResponse Id="1100" Source="803" Destination="100">
    <Article Id="1234">
      <ArticleRelation Type="CrossSelling">
        <RelatedArticle Id="4711"/>
        <RelatedArticle Id="4712"/>
      </ArticleRelation>
      <ArticleRelation Type="Alternative">
        <RelatedArticle Id="9214"/>
      </ArticleRelation>
    </Article>
    <Article Id="5678">
      <ArticleRelation Type="CrossSelling">
        <RelatedArticle Id="7892"/>
      </ArticleRelation>
      <ArticleRelation Type="Alternative">
      </ArticleRelation>
    </Article>
  </ArticleRelationResponse>
</WWKS>

```

Library

To be defined.

10.3.5 ArticlePriceRequest**Device support**

Device category	Rowa Device	Message support
ASRS	Rowa Vmax/Select	Not supported
Digital OTC Shelf	Rowa Vmotion	Supported
Pick-up Terminal	Rowa Vpoint Pick-up	Not supported
Self-checkout	Rowa Self-Checkout	Supported, deprecated

Structure

```

<WWKS>
  <ArticlePriceRequest>
    <Criteria>
      <Article/>
    </Criteria>
  </ArticlePriceRequest>
</WWKS>

```

Elements

Element	M/O	Data type	Description
ArticlePriceRequest	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the information process. This ID is returned in the <i>ArticlePriceResponse</i> message.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ArticlePriceRequest</i> message
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ArticlePriceRequest</i> message
Currency	O	String	The currency in which the prices are requested (according to ISO 4217, for example "EUR"). An empty value means "undefined".

Element	M/O	Data type	Description
Article	M	Tag	<i>Deprecated, please use criteria element instead.</i> Article information follows. This element can be used multiple times.
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article.

Element	M/O	Data type	Description
Criteria	O	Tag	Request criteria follows. May appear multiple time.
Attributes	M/O	Data type	Description and Values
ArticleId	O	String64	Request to deliver prices for this article id. Default value is „". This would be a request for all articles. Use with care to prevent overload of the PIS.
Category	O	String64	Request to deliver selected price categories. Value is a comma separated list of the category names, e.g. "Standard, Offer". An empty value is equivalent to „RRP, Standard, Offer". The IT system may deliver additional categories. Default value is „RRP, Standard, Offer".

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticlePriceRequest Id="1101" Source="100" Destination="999" Currency="EUR">
    <Criteria ArticleId="1234"/>
    <Criteria ArticleId="5678"/>
  </ArticlePriceRequest>
</WWKS>
```

Library

The library currently supports the deprecated version using ArticleId filters only.

The library does not support non-standard price categories.

```
var digitalShelf= new RowaDigitalShelf();

digitalShelf.ArticlePriceRequested += DigitalShelf_ArticlePriceRequested;

private void DigitalShelf_ArticlePriceRequested(IDigitalShelf sender,
IArticlePriceRequest request)
{
    Console.WriteLine(string.Format("Price information for '{0}' articles
has been requested from the digital shelf.", request.Articles.Count()));

    foreach (var article in request.Articles)
    {
        article.AddPriceInformation(PriceCategory.RRP, 100);
    }

    request.Finish();
}
```

10.3.6 ArticlePriceResponse

Device support

Device category	Rowa Device	Message support
ASRS	Rowa Vmax/Select	Not supported
Digital OTC Shelf	Rowa Vmotion	Supported
Pick-up Terminal	Rowa Vpoint Pick-up	Not supported
Self-checkout	Rowa Self-Checkout	Supported, deprecated

Structure

```
<WWKS>
  <ArticlePriceResponse>
    <Article>
      <PriceInformation/>
    </Article>
  </ArticlePriceResponse>
</WWKS>
```

Elements

Element	M/O	Data type	Description
ArticlePriceResponse	M	Tag	Message type
Attributes	M/O	Data type	Description and Values

Id	M	String	ID of the information process. Corresponds to the ID sent in the <i>ArticlePriceRequest</i> message.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ArticlePriceResponse</i> message
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ArticlePriceResponse</i> message
Currency	O	String	The currency in which the prices are requested (according to ISO 4217, for example "EUR").

Element	M/O	Data type	Description
Article	M	Tag	Article information follows. This element can be used multiple times.
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article.

Element	M/O	Data type	Description
PriceInformation	M	Tag	Price information follows. This element can be used multiple times.
Attributes	M/O	Data type	Description and Values
Category	M	String	The category of the price. Possible values are: "RRP" – the recommended retail price of the manufacture; "Offer" – for special offers; "Other" – for other.
Description	O	String	The description of the price category. For example, this can be the name of a discount promotion.

Quantity	O	Integer 32-bit >0	The corresponding number of packs, but for which the price given applies. The default value is "1".
Price	M	Decimal >0	The price for the specified quantity of the specified article in the smallest unit of the currency (e.g. cents) including VAT.
BasePrice	O	Integer 32-bit >0	The base price for the specified quantity of the specified article in the smallest unit of the currency (e.g. cents).
BasePriceUnit	O	String	The unit for which the base prices is specified (e.g. "100 ml").
VAT	O	Float >0	The associated VAT rate (Value Added Tax).

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticlePriceResponse Id="1101" Source="999" Destination="100" Currency="EUR">
    <Article ="Article-1234">
      <PriceInformation Category="RRP"
        Description="Unverbindliche Preisempfehlung" Quantity="1"
        Price="25.00" BasePrice="12.50" BasePriceUnit="100ml" VAT="19"/>
      <PriceInformation Category="Standard"
        Description="Normalpreis" Quantity="1"
        Price="20.00" BasePrice="10.00" BasePriceUnit="100ml" VAT="19"/>
      <PriceInformation Category="Offer"
        Description="3For2 Sale" Quantity="3"
        Price="40.00" BasePrice="6.66" BasePriceUnit="100ml" VAT="19"/>
    </Article>
  </ArticlePriceResponse>
</WWKS>
```

Library

See `ArticlePriceRequest`

10.3.7 ArticlePriceMessage

Notification of the pharmacy IT system that some prices have changed. The message does not contain any information which prices have changed. In reaction to this message, the device has to query the current prices for all articles it currently displays.

Device support

Device category	Rowa Device	Message support
ASRS	Rowa Vmax/Select	Not supported
Digital OTC Shelf	Rowa Vmotion	Planned
Pick-up Terminal	Rowa Vpoint Pick-up	Not supported
Self-checkout	Rowa Self-Checkout	Not supported

Structure

```
<WWKS>
  <ArticlePriceMessage>
  </ArticlePriceMessage>
</WWKS>
```

Elements

Element	M/O	Data type	Description
ArticlePriceMessage	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the notification message.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ArticlePriceMessage</i>
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ArticlePriceMessage</i>

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ArticlePriceMessage Id="1101" Source="100" Destination="0"/>
</ArticlePriceMessage>
</WWKS>
```

Library

Currently not implemented.

10.4 Serial number validation

Please refer to full WWKS2+ specification, not required for digital shelves.

11 Message reference III – Automated storage and retrieval system

Please refer to full WWKS2+ specification, not required for digital shelves.

11.1 Stock query

Device support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported for direct communication with Rowa Vmax, planned for PIS query.

The message description describes the case where a PIS queries an ASRS about its current stock. The message flow and details are exactly the same when a digital device queries the PIS about the pharmacy stock.

Lead Elements

StockInfoRequest

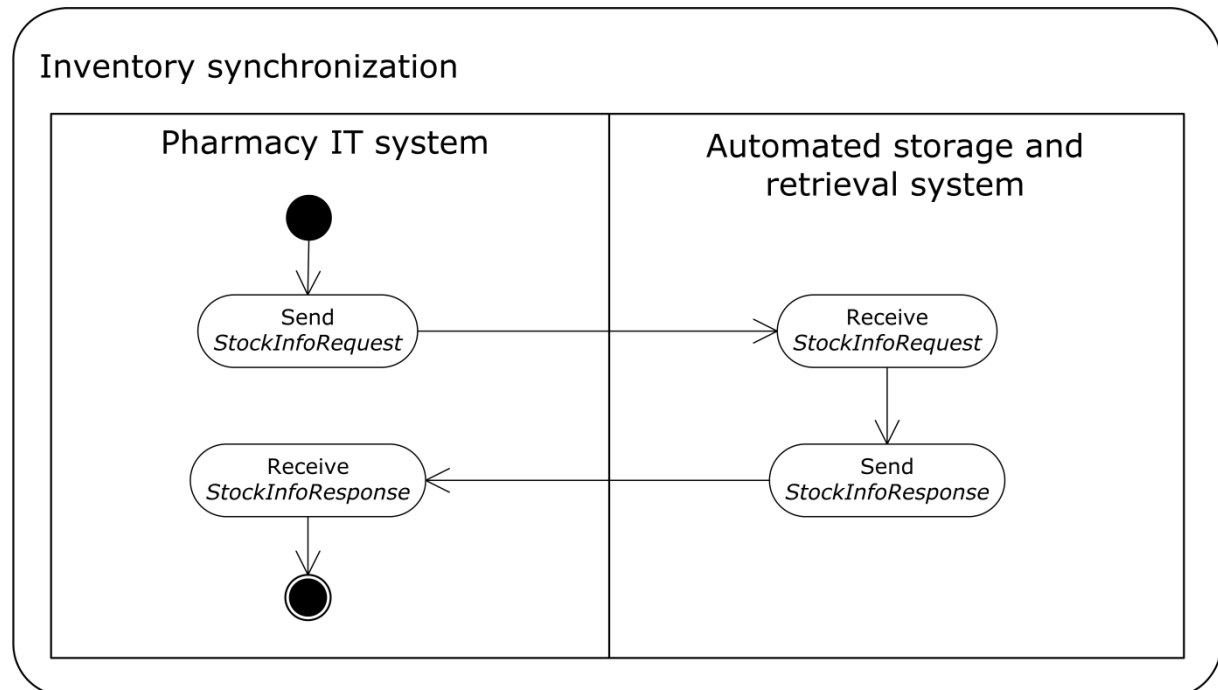
StockInfoResponse

Usage

To poll the current stock level in the automated storage and retrieval system, the pharmacy IT system can send the *StockInfoRequest*. The automated storage and retrieval system will respond with *StockInfoResponse*.

The prompt can be constrained by filters. If filters are set, the automated storage and retrieval system's response only contains articles and packs matching the set criteria. If no filters are defined, the full inventory is listed.

If there is no stock in the automated storage in retrieval system or if there are no articles corresponding to the filters defined in the search, the content of the *StockInfoResponse* message is empty (contains no *Article* elements).

Sequence

11.1.1 StockInfoRequest

Device support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported for direct communication with Rowa Vmax

Structure

```
<WWKS>
  <StockInfoRequest>
    <Criteria/>
  </StockInfoRequest>
</WWKS>
```

Elements

Element	M/O	Data type	Description
StockInfoRequest	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the inventory request. This ID is returned in the <i>StockInfoResponse</i> .
Source	M	Integer 32-bit >0	ID of the system sending the <i>StockInfoRequest</i> .
Destination	M	Integer 32-bit >0	ID of the system to which the <i>StockInfoRequest</i> is sent.
IncludeArticleDetails	O	Boolean	This flag specifies whether detailed article information like name, dosage form, etc. are to be returned. Possible values: "True" if details of the articles are to be sent "False" if only minimal article data is to be sent The default value is "False".

Element	M/O	Data type	Description
Criteria	O	Tag	Request filter follows. Multiple criteria can be defined.

Attributes	M/O	Data type	Description and Values
ArticleId	O	String	<p>By setting this filter, only articles with the specified article ID are included.</p> <p>The ID of the article must correspond to the one assigned by the pharmacy IT system when placing the article into stock in the <i>StockInputResponse</i>.</p>

Example with filter criteria

Returns all packs for article "0004" that have either batch "1234" or batch "5678". Does not return any packs of article "0004" that have another batch.

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <StockInfoRequest Id="1003" Source="100" Destination="999" IncludePacks="True">
    <Criteria ArticleId="0004" BatchNumber="1234"/>
    <Criteria ArticleId="0004" BatchNumber="5678"/>
  </StockInfoRequest>
</WWKS>
```

Library

PIS query currently not supported.

11.1.2 StockInfoResponse

Device support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported for direct communication with Rowa Vmax

Structure

```

<WWKS>
  <StockInfoResponse>
    <Article>
      <Pack/>
    </Article>
  </StockInfoResponse>
</WWKS>

```

Elements

Element	M/O	Data type	Description
StockInfoResponse	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the inventory request. This ID was sent in the <i>StockInfoRequest</i> .
Source	M	Integer 32-bit >0	ID of the system sending the <i>StockInfoResponse</i> .
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>StockInfoResponse</i> .

Element	M/O	Data type	Description
Article	M	Tag	Article information follows. This element may occur multiply.
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article. This ID corresponds to the one assigned by the pharmacy IT system when

			placing the article into stock in the <i>StockInputResponse</i> .
Name	O	String	Name of the article
DosageForm	O	String	Dosage form of the article
PackingUnit	O	String	Packaging unit of the article
MaxSubItemQuantity	O	Integer 32-bit >=0	Maximum number of units (e.g. pills or ampules) which might be contained in a full pack of the article. The value "0" means that the number of units is unknown.
Quantity	O	Integer 32-bit >0	Number of existing packs on stock of this article
Availability	O	String	<p>Availability of the summed stock reported in Quantity and/or SubItemQuantity attributes.</p> <p>Possible values:</p> <p>"Available": On stock, may be used for any incoming order</p> <p>"Reserved": On stock, but not available for a new order.</p> <p>"Orderable": Not on stock but available at short notice</p> <p>"NotAvailable": Currently not available.</p> <p>Default value is "Available".</p> <p><i>Currently not supported by Rowa devices.</i></p>

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <StockInfoResponse Id="1003" Source="999" Destination="100">
    <Article Id="0004-56-034-G00007T" Quantity="3">
    </Article>
  </StockInfoResponse>
</WWKS>
```

Library

PIS query currently not supported.

12 (Deprecated) Message reference IV – Sales transactions

The support of sales transaction is deprecated for digital shelves.

12.1 (Deprecated) Request shopping cart/sales transaction

Device support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported

Lead elements

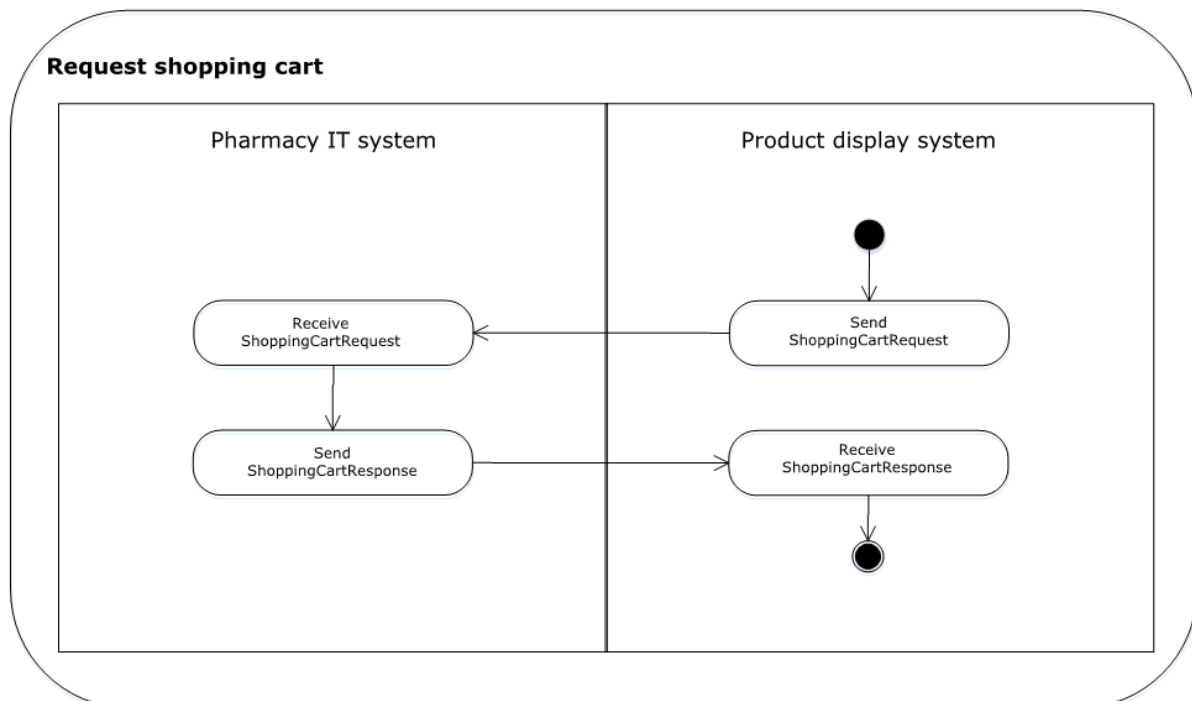
ShoppingCartRequest

ShoppingCartResponse

Usage

ShoppingCartRequest can be used by the behind-the-counter system to request both an existing and a new shopping cart/sales transaction. The pharmacy IT system responds with a *ShoppingCartResponse* containing the corresponding shopping cart/sales transaction.

Sequence



12.1.1 (Deprecated) ShoppingCartRequest**Device support**

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported, deprecated.

Structure

```

<WWKS>
  <ShoppingCartRequest>
    <Criteria/>
  </ShoppingCartRequest>
</WWKS>

```

Elements

Element	M/O	Data type	Description
ShoppingCartRequest	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the shopping cart request process.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ShoppingCartRequest</i> message.
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ShoppingCartRequest</i> message.

Element	M/O	Data type	Description
Criteria	M	Tag	Shopping cart filters follow. This element may occur once only.
Attributes	M/O	Data type	Description and Values
ShoppingCartId	O	String	ID of a shopping cart/order process.
SalesPointId	O	String	ID of a point of sale.
<i>ViewPointId</i>	O	String	<i>Deprecated. Devices have no longer to send this id.</i>

			ID of a behind-the-counter system.
SalesPersonId	O	String	ID of a salesperson.
CustomerId	O	String	ID of a customer.
PickupId	O	String64	Pick-up code shared with the patient.
DisplayLanguage	O	String	ISO-639-1 code of the current display language of the device.

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartRequest Id="1103" Source="100" Destination="999">
    <Criteria PickupId="PU64738"/>
  </ShoppingCartRequest>
</WWKS>
```

Library

```
var digitalShelf = new RowaDigitalShelf();
digitalShelf.ShoppingCartRequested += DigitalShelf_ShoppingCartRequested;

void DigitalShelf_ShoppingCartRequested(IDigitalShelf sender,
IShoppingCartRequest request)
{
    Console.WriteLine(string.Format("Shopping cart has been requested
from the digital shelf.));
    var shoppingCart =
digitalShelf.CreateShoppingCart(request.Criteria.ShoppingCartId,
ShoppingCartStatus.Active, "CustID", "SaleID", "salePointId", "ViewPointID");
    shoppingCart.AddItem("1", 10, 2, 5, "100", "EUR");
    shoppingCart.AddItem("2", 50, 10, 50, "10", "FR");
    request.Accept(shoppingCart);
    shoppingCart.Status = ShoppingCartStatus.Finished;
    shoppingCart.SalesPointId = "1";
    shoppingCart.ViewPointId = "2";
    shoppingCart.SalesPersonId = "3";
    shoppingCart.CustomerId = "4";
    digitalShelf.UpdateShoppingCart(shoppingCart);
}
```


12.1.2 (Deprecated) ShoppingCartResponse

Device support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported, deprecated.

Structure

```

<WWKS>
  <ShoppingCartResponse>
    <ShoppingCart>
      <ShoppingCartItem>
      </ShoppingCartItem/>
    </ShoppingCart>
  </ShoppingCartResponse>
</WWKS>

```

Elements

Element	M/O	Data type	Description
ShoppingCartResponse	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the shopping cart request process.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ShoppingCartResponse</i> message.
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ShoppingCartResponse</i> message.
Description	O	String	Human readable text with information about the transaction or reason for reject. To be displayed on the device.

Element	M/O	Data type	Description
ShoppingCart	O	Tag	The shopping cart/order process provided by the pharmacy IT system. This element may occur multiple.

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartResponse Id="1103" Source="999" Destination="100">
    <ShoppingCart Id="SC-2345" SalesPointId="103 Status="Active" PickupId="PU64738"
      SalesPersonId="SalesPerson-4711" CustomerId="Customer-42">
      <ShoppingCartItem ArticleId=" 1111" Name="Article-1111"
        OrderedQuantity="1" DispensedQuantity="0"
        PaidQuantity="1" Price"4.95" Currency="EUR" VAT="19.0"/>
    </ShoppingCart>
  </ShoppingCartResponse>
</WWKS>
```

Library

See `ShoppingCartRequest`.

12.2 (Deprecated) Modify shopping cart/sales transaction

Device support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported

Lead elements

ShoppingCartUpdateRequest

ShoppingCartUpdateResponse

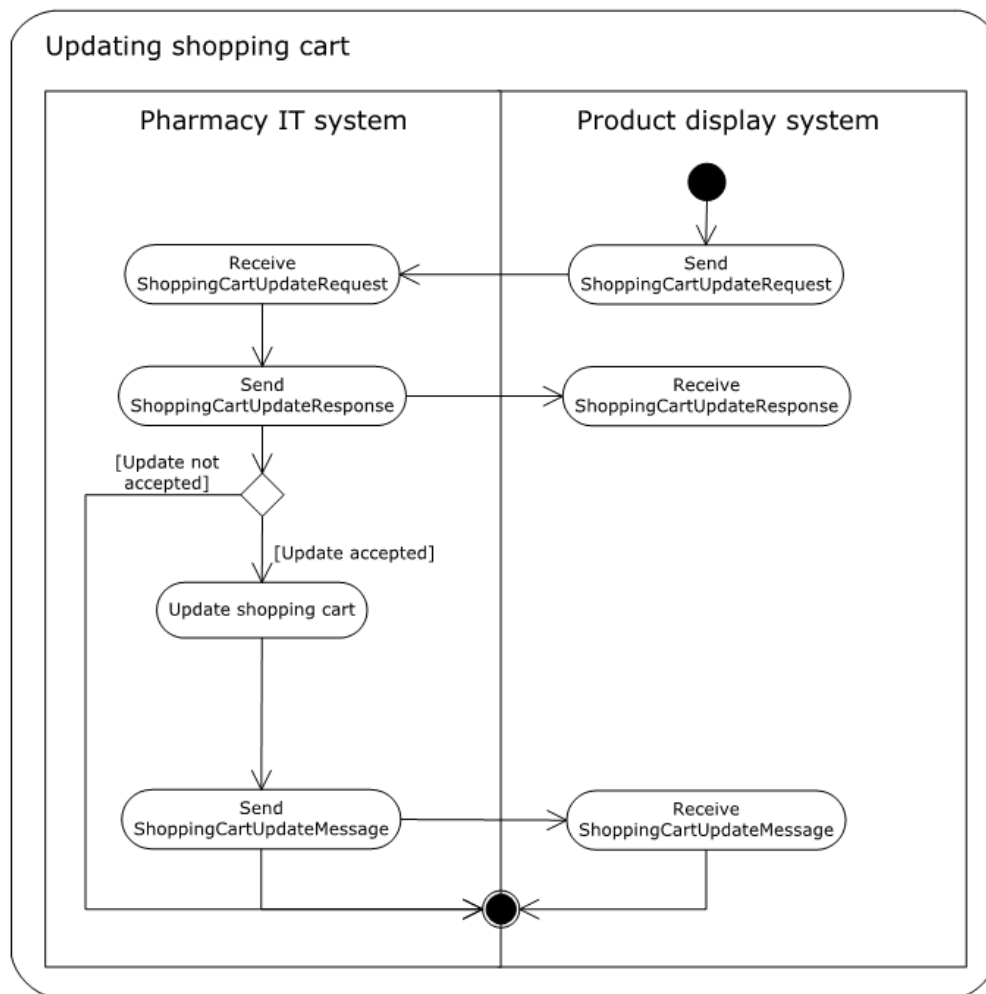
ShoppingCartUpdateMessage

Usage

ShoppingCartUpdateRequest is used by a behind-the-counter system to request changes to a shopping cart/order process. Changes include discarding or concluding an order process, adding and deleting items or changing the number of units for an item. The complete shopping cart is transferred in all cases.

The pharmacy IT system responds to the request with a *ShoppingCartUpdateResponse*, which provides information on the status of the change and concludes by publishing the current shopping cart in a *ShoppingCartUpdateMessage*.

Sequence



12.2.1 (Deprecated) ShoppingCartUpdateRequest

Device support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported, deprecated. Action attribute support planned.

Structure

```

<WWKS>
  <ShoppingCartUpdateRequest>
    <BarcodeScanned/>
    <Add/>
    <Delivery/>
    <ChangeQuantity/>
    <Payment/>
  
```

```
<PaymentRequest/>
<Transfer/>
<Language/>
<CartUpdate/>
<QueryAnswer/>
<ShoppingCart>
  <ShoppingCartItem/>
  <PaymentItem/>
  <Receipt/>
</ShoppingCart>
</ShoppingCartUpdateRequest>
</WWKS>
```

Elements

Element	M/O	Data type	Description
ShoppingCartUpdateRequest	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the shopping cart change process.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ShoppingCartUpdateRequest</i> message.
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ShoppingCartUpdateRequest</i> message.
Action	O	String	<p><i>Deprecated, use update request element instead.</i></p> <p>Type of modification.</p> <p>Each update request should contain only similar changes (see 0 <i>Please refer to full WWKS 2+ specification, not required for digital shelves.</i></p> <p>(Deprecated) Sales Transaction). The PIS may ignore modification not matching the action value.</p> <p>Possible values:</p> <p>„Order“: Add or remove shopping cart lines. Change the order quantity of shopping cart lines. To add a lines, the device has to know the article id of the item, it must not use the barcode scanned.</p> <p>„Pricing“: Change of the price of the shopping cart or one or multiple shopping cart lines.</p> <p>„Delivery“: Change the delivered quantity.</p> <p>„Payment“: Change of paid quantity.</p> <p>„PaymentRequest“: Request to the PIS to handle the payment of the shopping cart and to return the transaction details in the response.</p> <p>„Transfer“: Modify point of sale, customer, sales person or other generic attributes of the sales transaction.</p>

			<p>„BarcodeScan“: A barcode was scanned that might be relevant for the shopping cart. The content of the barcode is transferred in the <code>Barcode</code> attribute.</p> <p>„LoyaltyCardScanned“: A loyalty card or another card identifying the customer has been scanned. The content of the barcode is transferred in the <code>Barcode</code> attribute.</p> <p>„CouponScanned“: A coupon has been scanned. The PIS should apply the discount defined by the coupon to the shopping cart. The content of the barcode is transferred in the <code>Barcode</code> attribute.</p> <p>“CartUpdate”: Request to take over full shopping cart as provided by device in the request.</p> <p>Default value: “CartUpdate”.</p>
Barcode	O	String	<p><i>Deprecated. Use <code>BarcodeScanned</code> update request element instead.</i></p> <p>Barcode scanned. E.g. Item code, loyalty card or coupon. Used in combination with <code>Action</code> attribute values <code>BarcodeScan</code>, <code>LoyaltyCard</code>, <code>Coupon</code></p>

At least one of the update request elements listed below should appear in the request. If no update request element is given, the IT system assumes that a `<CartUpdate>` element is used:

Element	M/O	Data type	Description
BarcodeScanned	O	Tag	<p>Request to modify a shopping cart according to a barcode scanned at the device by a user.</p> <p>May appear only once.</p>
Attributes	M/O	Data type	Description and Values
Barcode	M	String	ID of the article to be added.
Type	O	String	<p>Type of the scanned barcode. Possible values:</p> <p>“Unknown”: Device does not know what kind of barcode has been scanned by the user.</p>

			<p>"Article": Barcode of an article. The barcode might be different to the article id.</p> <p>"LoyaltyCard": Barcode of a loyalty card.</p> <p>"Coupon": Barcode of a discount coupon.</p> <p>Default value: "Unknown"</p>
--	--	--	--

Element	M/O	Data type	Description
Add	O	Tag	Request to add a line to the shopping cart. May appear only once.
Attributes	M/O	Data type	Description and Values
ArticleId	M	String	ID of the article to be added.
OrderedQuantity	M	Int	Ordered quantity of the article.

Element	M/O	Data type	Description
Delivery	O	Tag	Request to the IT system to accept delivery all or parts of the ordered quantity of an article in the shopping cart. May appear multiple.
Attributes	M/O	Data type	Description and Values
ArticleId	M	String	ID of the article to be added.
DispensedQuantity	M	Int	Number of packs delivered in this action.

Element	M/O	Data type	Description
ChangeQuantity	O	Tag	Request to modify the ordered quantity of an article in the shopping cart. May appear multiple.
Attributes	M/O	Data type	Description and Values

ArticleId	M	String	ID of the article to be added.
OrderedQuantity	M	Int	New (absolute) number of packs ordered for the article.

Element	M/O	Data type	Description
PaymentRequest	O	Tag	Request to the IT system to perform payment of the shopping cart. May appear only once.
Attributes	M/O	Data type	Description and Values
<i>none</i>			

Element	M/O	Data type	Description
Payment	O	Tag	Request to the IT system to accept full or partial payment of the shopping cart. May appear only once.

Element	M/O	Data type	Description
PaymentItem	M	Tag	Detail information of the Payment.

Element	M/O	Data type	Description
Language	O	Tag	Request to modify the display language of the shopping cart. May appear only once.
Attributes	M/O	Data type	Description and Values
DisplayLanguage	M	String	ISO-639-1 code of new display language.

Element	M/O	Data type	Description
CartUpdate	O	Tag	Request to replace current shopping cart with the content of the ShoppingCart in this ShoppingCartUpdateRequest. Defined to maintain backwards compatibility with older version of WWKS2+ that did not define update request elements.
Attributes	M/O	Data type	Description and Values
<i>none</i>			

Element	M/O	Data type	Description
Transfer	O	Tag	Request to modify the ordered quantity of an article in the shopping cart. May appear only once. Must not be combined with other update request elements
Attributes	M/O	Data type	Description and Values
SalesPointId	M	Int	ID of the sales point to transfer the shopping cart to. Empty to indicate that devices has finished handling the shopping cart and wants to return it to the IT system. Default value is "".

Element	M/O	Data type	Description
QueryAnswer	O	Tag	Answer provided by the user of the device in response to a ShoppingCartUpdateResponse with <code>UpdateResult.Status="Query"</code> . May appear only once.
Attributes	M/O	Data type	Description and Values
Text	M	String	Text of the query answer that has been selected by the user of the device.

Element	M/O	Data type	Description
ShoppingCart	O	Tag	<p>Details of the sales updated transaction from the device point of. The IT system may ignore this and return the modified shopping cart according to its own state.</p> <p>This element may occur once only.</p>

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateRequest Id="1104" Source="100" Destination="999">
    <BarcodeScanned Type="Unknown" Barcode="857673463">
      <ShoppingCart Id="SC-2345">
        <ShoppingCartItem ArticleId="1111" OrderedQuantity="1"/>
        <ShoppingCartItem ArticleId="2222" OrderedQuantity="2"/>
      </ShoppingCart>
    </ShoppingCartUpdateRequest>
  </WWKS>
```

Library

```
var digitalShelf = new RowaDigitalShelf();
digitalShelf.ShoppingCartUpdateRequested +=
DigitalShelf_ShoppingCartUpdateRequested;
void DigitalShelf_ShoppingCartUpdateRequested(IDigitalShelf sender,
IShoppingCartUpdateRequest request)
{
    Console.WriteLine(string.Format("Shopping cart update has been
requested from the digital shelf.));
    // process update
    request.Accept("Shopping cart has been updated successfully");
}
```

12.2.2 (Deprecated) ShoppingCartUpdateResponse

Device support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Supported, deprecated.

Structure

```
<WWKS>
  <ShoppingCartUpdateResponse>
```

```

    <ShoppingCart/>
    <UpdateResult/>
  </ShoppingCartUpdateResponse>
</WWKS>

```

Elements

Element	M/O	Data type	Description
ShoppingCartUpdateResponse	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the shopping cart change process.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ShoppingCartUpdateResponse</i> message.
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ShoppingCartUpdateResponse</i> message.
Action	O	String	<i>Deprecated.</i> Type of modification as defined in the <i>ShoppingCartUpdateRequest</i> .

Element	M/O	Data type	Description
ShoppingCart	M	Tag	Details of the sales transaction. This element may occur once only.

Element	M/O	Data type	Description
UpdateResult	M	Tag	Details the status of the shopping cart update. This element may occur once only.
Status	M	String	The type of shopping cart change requested. Possible values: "Updated", if the requested update has been performed. "NotUpdated", if the requested update has not been performed.

			"Query", if further information is required from the user. Possible answer options are provided in the <code>Query</code> elements.
Description	O	String	Free text detailing additional information on the status of the update. The text is normally used when rejecting an update to provide detailed information on the reasons for rejecting the update or for querying additional information from the user. The text may be displayed on the behind-the-counter system, and should therefore be localized according to the <code>DisplayLanguage</code> of the shopping cart.

Element	M/O	Data type	Description
Query	M/O	Tag	Mandatory in case <code>Status="Query"</code> . Provides an answer option that the device presents to the user. May appear multiple.
Text	M	String	Text of the answer option.

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateResponse Id="1104" Source="999" Destination="100">
    <ShoppingCart Id="SC-2345">
      <ShoppingCartItem ArticleId="1111" Name="Article-1111" OrderedQuantity="5"/>
      <ShoppingCartItem ArticleId="1111" Name="Article-1111" OrderedQuantity="1"
        DispensedQuantity="0" PaidQuantity="0" Price="15.00" VAT="19.0">
        <Article Id="1111">
          <PriceInformation Category="Standard" Description="List price"
            Quantity="1" Price="20.00" BasePrice="10.00" BasePriceUnit="100ml"
            VAT="19"/>
          <PriceInformation Category="Offer" Description="Offer" Quantity="1"
            Price="15.00" BasePrice="7.50" BasePriceUnit="100ml" VAT="19"/>
          <Tag Value="AgeVerification"/>
        </Article>
      </ShoppingCartItem>
      <ShoppingCartItem ArticleId="2222" Name="Article-2222" OrderedQuantity="4"
        DispensedQuantity="4" PaidQuantity="4" Price="18.95" VAT="19.0">
        <Article Id="2222">
          <PriceInformation Category="Standard" Description="List price"
            Quantity="1" Price="18.95" BasePrice="18.95" BasePriceUnit="10"
            VAT="19"/>
        </Article>
      </ShoppingCartItem>
    </ShoppingCart>
  </ShoppingCartUpdateResponse>
</WWKS>
```

```
<Tag Value="Consultation"/>
</Article>
<ShoppingCartItem/>
</ShoppingCart>
<UpdateResult Status="Updated" Description="Item has been added."/>
</ShoppingCartUpdateResponse>
</WWKS>
```

Library

See *ShoppingCartUpdateRequest*.

12.2.3 (Deprecated) ShoppingCartUpdateMessage

Device support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Not supported

Structure

```
<WWKS>
  <ShoppingCartUpdateMessage>
    <ShoppingCart>
      <ShoppingCartItem/>
    </ShoppingCart>
  </ShoppingCartUpdateMessage>
</WWKS>
```

Elements

Element	M/O	Data type	Description
ShoppingCartUpdateMessage	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the shopping cart change process.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ShoppingCartUpdateMessage</i> message.
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ShoppingCartUpdateMessage</i> message.

Element	M/O	Data type	Description
ShoppingCart	M	Tag	Details of the sales transaction. This element may occur once only.

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">
  <ShoppingCartUpdateMessage Id="1104" Source="999" Destination="100">
    <ShoppingCart Id="SC-2345">
      <ShoppingCartItem ArticleId="1111" Name="Article-1111" OrderedQuantity="4"/>
    </ShoppingCart>
  </ShoppingCartUpdateMessage>
</WWKS>
```

```
<ShoppingCartItem ArticleId="2222" Name="Article-2222" OrderedQuantity="0"/>
</ShoppingCart>
</ShoppingCartUpdateMessage>
</WWKS>
```

Library

Currently not implemented.

12.3 Article selection

Device support

Device category	Rowa Device	Message support
Digital OTC Shelf	Rowa Vmotion	Under development

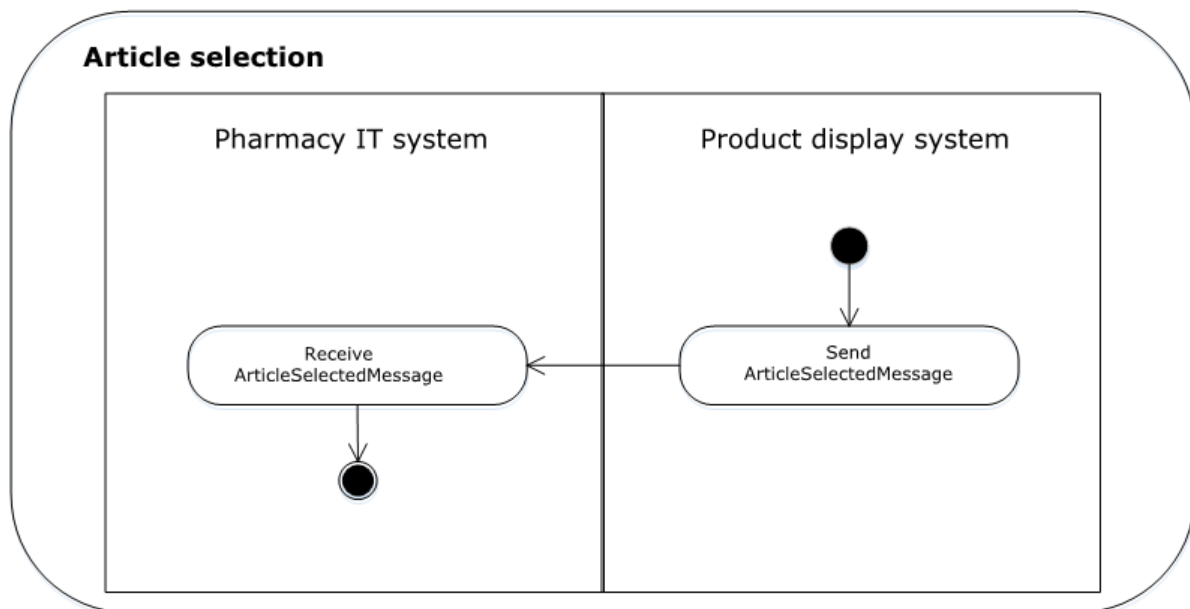
Lead elements

ArticleSelectedMessage

Usage

The device can send an *ArticleSelectedMessage* once an article has been selected.
The pharmacy IT system may use this information for statistical purposes, for example.

Sequence



12.3.1 ArticleSelectedMessage

Device support

Device category	Rowa Device	Message support
ASRS	Rowa Vmax/Select	Not supported
Digital OTC Shelf	Rowa Vmotion	Supported
Pick-up Terminal	Rowa Vpoint Pick-up	Not supported
Self-checkout	Rowa Self-Checkout	Not supported

Structure

```
<WWKS>
  <ArticleSelectedMessage>
    <Article/>
  </ArticleSelectedMessage>
</WWKS>
```

Elements

Element	M/O	Data type	Description
ArticleSelectedMessage	M	Tag	Message type
Attributes	M/O	Data type	Description and Values
Id	M	String	Message ID.
Source	M	Integer 32-bit >0	ID of the system sending the <i>ArticleSelectedMessage</i> message
Destination	M	Integer 32-bit >0	ID of the system intended to receive the <i>ArticleSelectedMessage</i> message
SalesPointId	O	String	ID of the point of sale that should handle the article selection.

Element	M/O	Data type	Description
Article	M	Tag	Article information follows. This element may occur once only.

Attributes	M/O	Data type	Description and Values
Id	M	String	ID of the article.
Quantity	O	Integer 32-Bit > 0	Number of selected packs of the article. Default value is 1.

Example

```
<WWKS Version="2.0" TimeStamp="2013-04-16T11:14:00Z">  
  <ArticleSelectedMessage Id="1105" Source="100" Destination="999"  
    SalesPointId="3">  
    <Article Id="1234" Quantity="1"/>  
  </ArticleSelectedMessage>  
</WWKS>
```