



# Algo Flagging

## How to meet the regulatory requirements?

Member communication on Algo Flagging according to the German HFT Act

Version 1.2 March 2014



# Agenda

**1. Motivation**

2. Legal background

3. Guidelines

## Why labelling algorithmic trading for surveillance/regulatory reasons?

### Speed (HFT) is not the problem, but:

- § Surveillance quality suffers. Automation of trading has made surveillance more difficult. Incoming data is highly aggregated and cannot be disaggregated appropriately
- § Trading Surveillance does not have "the one" single contact person on the member side, as the firm's intellectual property (IP) is distributed across members' staff
- § Members are in general hesitant to explain and share information of applied strategies - even towards regulators, as it is confidential business information / confidential IP
- § Due to lack of historical patterns, trading decisions are not reproducible for regulators/supervisors (as logic and input variables may not be available)
- § New originators of abusive behavior (counterpart is not a human, but a machine); new systemic risk based on technical failures and software bugs (distortion, spiral and herding effects)
- § In the past, one person (trader) was directly responsible for trading actions; today machines are trading, thus difficult to prove violation intentions

**CORE PRINCIPLE: Secure, enhance and enable surveillance to describe a cause and effect relationship**

# Agenda

1. Motivation

**2. Legal background**

3. Guidelines

## Legal basis

### German legislator and regulators legal foundation:

German HFT law (omnibus bill) amended various regulatory sources on Algo Trading and established Algo Flagging requirement

§ 16 sub-para. 2 no. 3 of the Boersengesetz (henceforth referred to as 'Exchange Act') § 33 sub-para. 1a of the Wertpapierhandelsgesetz (henceforth referred to as 'Securities Trading Act'), § 17a of the Exchange Rules for Eurex Deutschland and Eurex Zurich)

Guidelines to the adherence to the requirement of the labelling of trading algorithms (henceforth referred to as "Guidelines") are information provided by the Hessische Börsenaufsichtsbehörde (henceforth referred to as 'Exchange Supervisory') on the interpretation of the named statutory provisions and regulations in the Exchange Rules. The bodies of the exchange, in particular the Trading Surveillance Offices (henceforth referred to as TSO), will also apply the regulations corresponding to these interpretations

## Eurex Exchange Rules

### Exchange Rules of Eurex Deutschland and Eurex Zurich

§17 a Identification of algorithmic orders and of trading algorithms:

(1) Exchange Participants are obligated to mark the orders and firm quotes generated through algorithmic trading within the meaning of section 33 paragraph 1a sentence 1 of the Securities Trading Act and to identify the trading algorithms used in each case. This shall also apply in the event that orders are being transmitted via an Order Routing System.

(2) The orders or quotes must be marked when they are entered into the EDP-System of the Eurex Exchanges. The trading algorithms used in each case must be identified when orders or quotes resulting from the trading algorithms are entered into the EDP-System of the Eurex Exchanges and when such orders or quotes are modified or deleted. The marking of the orders or quotes generated and the identification of the trading algorithms used in each case must be made using the appropriate input options of the EDP-System of the Eurex Exchanges. The marking of the orders or quotes generated and the identification of the algorithms used in each case must be comprehensible, definite and consistent. Trading algorithms must be identified by setting out the complete automated decision-making process by which the entry of orders or quotes into the EDP-System of the Eurex Exchanges or the modification or deletion of such orders or quotes was effected.

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## Legal nature of the Guidelines\*

- § Administrative interpretation of the named statutory provisions and regulations in the Exchange Rules; non binding, however, full compliance with the Guidelines minimizes/ reduces regulatory risk of participants towards zero
- § Moreover, in particular: TSO will also adhere to these interpretations of the Guidelines. They will serve as a basis for audits and regulatory assessments

\*Source: Guidelines to the adherence to the requirement of the labelling of trading algorithms, Hessisches Ministerium für Wirtschaft, Verkehr und Landesentwicklung, 20 December 2013. Link: See page 25.

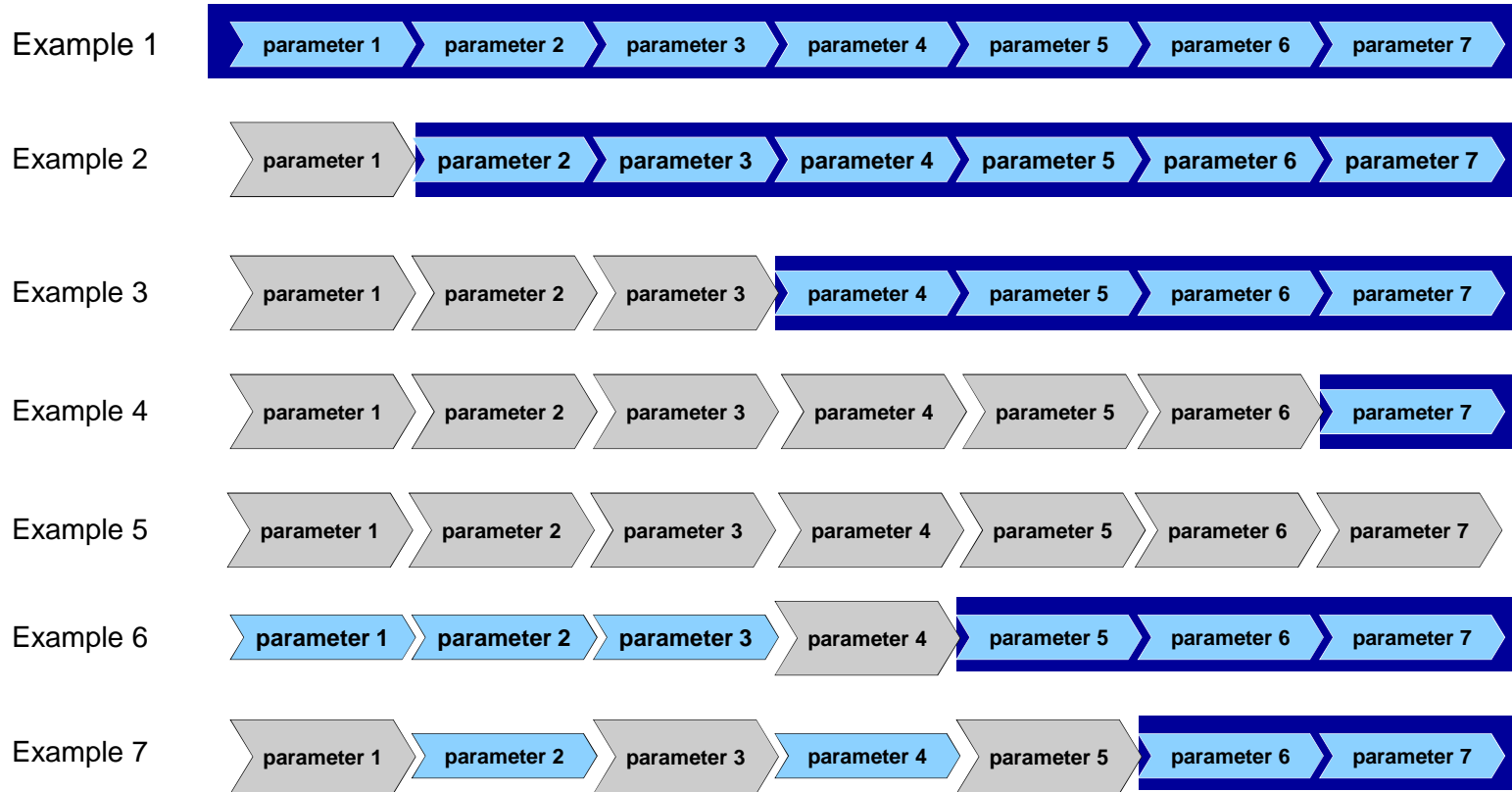
## What is an algorithm according to the Guidelines?

- § A **trading algorithm** is an EDP-operated algorithm containing a well-defined, executable sequence of instructions with a finite length to perform trading, i.e. containing the definition of the order parameters as well as the entry, change and deletion of orders while a human interference is **not** required for this purpose
- § Constituents of a **trading algorithm** are all instructions that determine, change or delete one or more of the following parameters of an order automatically:
- Instrument
  - Buy or sell
  - Size of the order
  - Order type
  - Price limit
  - Trading venue
  - Instant of time of transition to the trading venue

## What is to be flagged according to the Guidelines?

- § Orders which are generated by an algorithm according to the definition on p. 9 and are entered, changed or deleted without human interference
- § Only the sequence of instructions (decision path) that determines the order parameters without any human intervention needs to be flagged. See examples on next page for further details

# Which sequence of instructions are in the scope of flagging according to the Guidelines?



**Legend:**



automatic determination of the relevant parameter



manual determination of the relevant parameter



trading algorithm according to the definition on p.10 that needs to be flagged

## How to flag algorithms according to the Guidelines?

- § **The entire sequence of instructions (decision path) is to be identified** as a trading algorithm which effects that an order entry or its change or deletion is entered into the trading system of the exchange
- § Thus, the identification obligation is referring to the whole sequence of instructions (**decision path**) that determines the order parameters mentioned on p. 9 without human intervention and not to their individual elements, even if the latter could separately be considered as an independent algorithm
- § A trading algorithm is deemed to be different and needs to be flagged differently if one or more of its constituent instructions were changed and therefore result in a different behaviour compared to the previous version
- § Flagging has to be unequivocal and constant in time for the “new” trading algorithm as such

## Practical Examples (1/4)

- I. A trading participant operates an execution-algorithm that is able to track e.g. a TWAP or VWAP. This involves two different trading algorithms within the definition of section 1 of the guidelines. The two trading algorithms are required to be labelled differently.
- II. A trading participant operates a quotation algorithm e.g. for a stock having a more liquid domestic market. In case the domestic market is open, the quotation is based on the prices determined in that market. In case the domestic market is still closed, the quotation is based on the futures market. The instruction sequences are consequently different in both cases, thus two different trading algorithms are required to be labelled.
- III. A trading participant operates a quotation algorithm comprising business news, e.g. the value of an index as an input. This piece of information could derive from different sources (e.g. from different data vendors). The trading algorithm subject to labelling remains its labelling even if the source of information is different, since the trading algorithm remains unchanged.
- IV. A trading participant operates a system called 'my trading' that conducts automated market making and statistic arbitrage. Thus, such a system consists at least of two algorithms even if the two business areas are programmed in 'one system'. As a consequence, one part of the instructions in the system continuously apply to market making only - and vice versa - one part of the instructions constantly apply to statistic arbitrage only. Insofar as the trading participant labels the system 'my trading' for each trading activity and as one single algorithm only, the requirement for the individual labelling of differentiating algorithms is not fulfilled.

## Practical Examples (2/4)

V. A trading participant operates a 'Smart-Order-Routing-System' that decides to place an order in its entirety or in part to one or several trading venues while considering the current order book situations to realise an order execution at the best price currently offered. Since the trading algorithms subject to the system are not designed for order routing purposes to a trading venue only, but automatically decide on the point in time, the volume and limit of the individual partial executions of the order in consideration of current market data without human interference, algorithmic trading is involved. The orders placed and the trading algorithms used are subject to the labelling requirement.

New update

- VI. A direct exchange participant (A) has a client who again is a direct exchange participant (B). B generates algorithmic orders and sends them to A. The following two cases need to be distinguished:
- a. If A routes the order to the exchange without any changes (purely forwarding in terms of order routing), B has to flag his order (e.g., with algo ID "123") and A has to route the algo ID to the exchange. The exchange then receives the order containing the algo ID "123". If applicable, A can make sure that "123" applies for his client B, cf. Section 7, Trading of direct trading participants via third parties, "Guidelines to the adherence to the requirement of the labelling of trading algorithms." In other words, where A has received an order with an algo ID from B and passes on that order to the exchange (pure DMA), B has to arrange for A to simply pass on B's algo ID or a unique translated value.
  - b. If A changes at least one of the seven order parameters of the order from B by using its own trading algorithms (e.g., by deploying a smart order router), A has to flag only its algorithm (e.g., the algo ID "456"). The algo ID of B is independent of A's ID. A has to submit solely its own ID "456" to the exchange, but may additionally submit B's algo ID. In other words, where A has received algo IDs from B and have in turn changed a parameter in respect of that order, A is not obliged to send on B's algo IDs, only A's own algo ID or a unique translated combination of the two.

## Practical Examples (3/4)

VII. A broker implements a risk solution in his order routing system (ORS) as a function that can delete all open orders of a client in the order book. This function is triggered if the connectivity to the client is lost (heartbeat). As long as the deletion is a direct result of a lost connectivity and the outcome is the de-activation of the client, there is no need to flag this as algorithmic trading as the deletions are not part of any trading strategy of the client and therefore are not deemed to be algorithmic as defined by this guideline. The deletion of all orders of the client without any filtering is the decisive pre-condition.

New update

VIII. Trading participants should use the RegID field for flagging their own applications. When flagging algorithms from independent software vendor (ISV) applications, use of the Application Identifier might be necessary. By utilizing both the RegID and the Application Identifier, trading participants can ensure uniqueness amongst their various algorithmic order and quote generation applications - even when the ISVs use the same flag (see example a below).

- a. Use of ISV applications: Trading participant A uses application 1 and application 2 each from different software vendors. Application 1 uses the RegulatoryID "123" and trades VWAP, while application 2 also sends "123" but instead trades TWAP. As these applications are from two different vendors, use of the Application Identifier in combination with the RegID field will ensure the uniqueness of each algorithm. In accordance with the Exchange Regulations, application identifiers must be registered with the exchanges.

Registration of an Application Identifier (form):

eurexchange.com > Resources > Forms > Trading Derivatives > Technical > Miscellaneous

[http://forms.eurexchange.com/xfmws/binary/en/05\\_Markets\\_Services\\_-\\_Vendor\\_Relations+\\_Member\\_Readiness/DBAG\\_Exchange\\_Registration\\_Application\\_Identifier.pdf](http://forms.eurexchange.com/xfmws/binary/en/05_Markets_Services_-_Vendor_Relations+_Member_Readiness/DBAG_Exchange_Registration_Application_Identifier.pdf)

[\\_Vendor\\_Relations+\\_Member\\_Readiness/DBAG\\_Exchange\\_Registration\\_Application\\_Identifier.pdf](http://forms.eurexchange.com/xfmws/binary/en/05_Markets_Services_-_Vendor_Relations+_Member_Readiness/DBAG_Exchange_Registration_Application_Identifier.pdf)

xetra.com > Home > Admission to trading > Admission Xetra > Forms > Other Authorisations

[http://xqs.deutsche-boerse.com/xfmws/binary/en/05\\_Markets\\_Services\\_-\\_Vendor\\_Relations+\\_Member\\_Readiness/DBAG\\_Exchange\\_Registration\\_Application\\_Identifier.pdf](http://xqs.deutsche-boerse.com/xfmws/binary/en/05_Markets_Services_-_Vendor_Relations+_Member_Readiness/DBAG_Exchange_Registration_Application_Identifier.pdf)

[\\_Vendor\\_Relations+\\_Member\\_Readiness/DBAG\\_Exchange\\_Registration\\_Application\\_Identifier.pdf](http://xqs.deutsche-boerse.com/xfmws/binary/en/05_Markets_Services_-_Vendor_Relations+_Member_Readiness/DBAG_Exchange_Registration_Application_Identifier.pdf)



## Practical Examples (4/4)

- b. Use of own applications: Trading participants developing their own software should only make use of the RegID field, and are not allowed to use the ApplicationID to differentiate between different algorithms. As trading members have full control over their own software and applications, the uniqueness should already be achieved using the RegulatoryID field.

This doesn't apply when using FIX-connectivity.

- IX. The following examples are considered to be algorithms given their automated nature and are therefore regularly within the scope of the flagging obligation.

1. OMS
2. Tick size rounding mechanisms
3. Mechanisms that hold orders until the market is open (order queuing)
4. Any market to limit price conversion that is done
5. Anything automatically cancelling orders (for example if a client breaches exposure limits) (except heartbeat, see example VII)

Flagging of such algorithms is, however, not required, if such mechanisms/processes are part of “a system that is used merely to forward orders to one or more execution venues” (Section 33 para. 1a sentence 1 German Securities Trading Act).

Please note that in certain cases an order routing system which contains such mechanisms/processes might – depending on the impacts these have on the processing of orders – not be deemed as being “used merely to forward orders”.

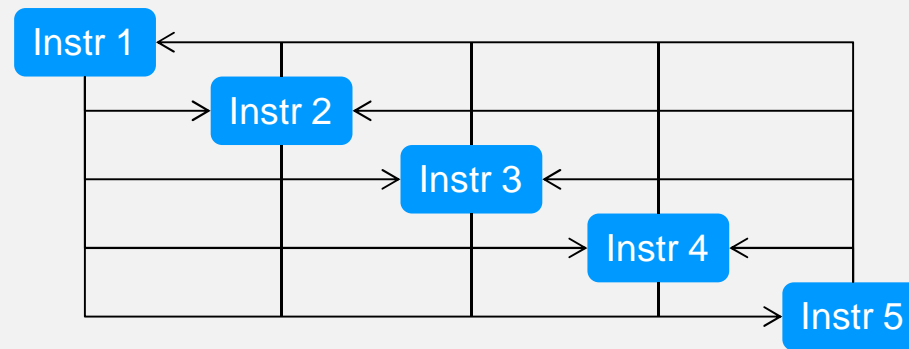
## Examples\* on how to flag sequences of trading algorithms/instructions

- § The HFT law requires the entire decision path to be flagged. This requirement is independent of how the participant defines the boundaries of one (or more) algorithm(s): The same sequence of instructions could be hosted in just one algorithm, or be split between multiple algorithms.
- § This implies that the same flagging logic applies, whether participants have only one or multiple algorithms – with the same sequence of instructions – implemented
- § In section 6 of the Guidelines, the examples refer to a situation where a participant needs to flag orders generated by multiple **algorithms** (each one may consist of a sequence of instructions). Here, the following examples show that the same illustrations apply also for a participant who looks at the **sequence of instructions** without setting boundaries for individual algorithms

\* Note: For theoretical examples on how to flag sequences of trading algorithms / instructions see next slides.

## Example 1

Assume participant A has an algo with 5 independent instructions (instr) which can interact with each other. This is illustrated in the picture below. The following slides will give details of possible flagging options.

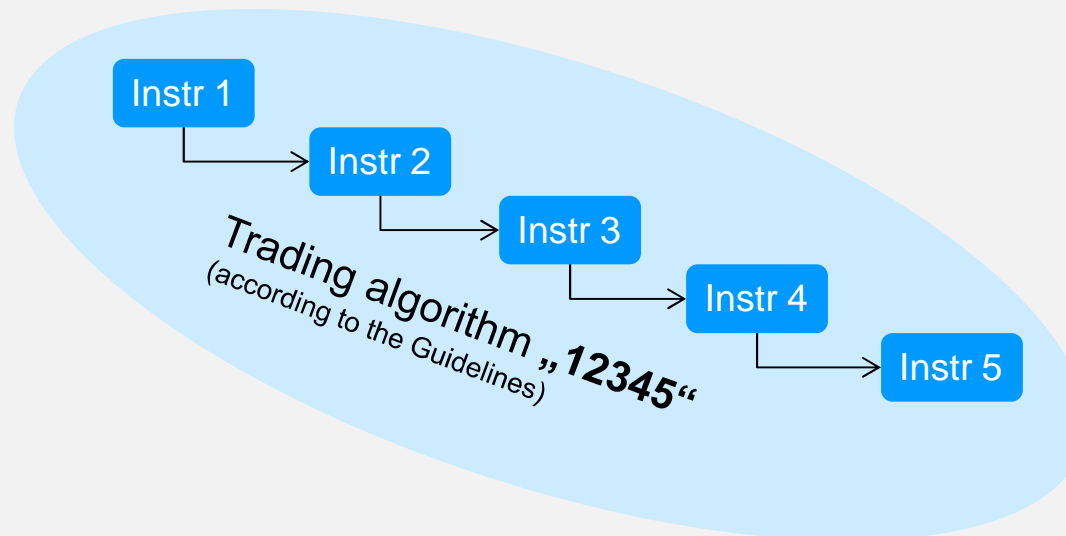


## Example 1.1

Assume participant A has an algo with 5 independent instructions which can interact with each other. This is illustrated in the picture below.

Possible flagging ...

**12345** would be the result from instruction 1 initiating the order creation, which is then passed and amended through instruction 2, instruction 3, instruction 4 and finally instruction 5 before entering into the Exchange EDP-System

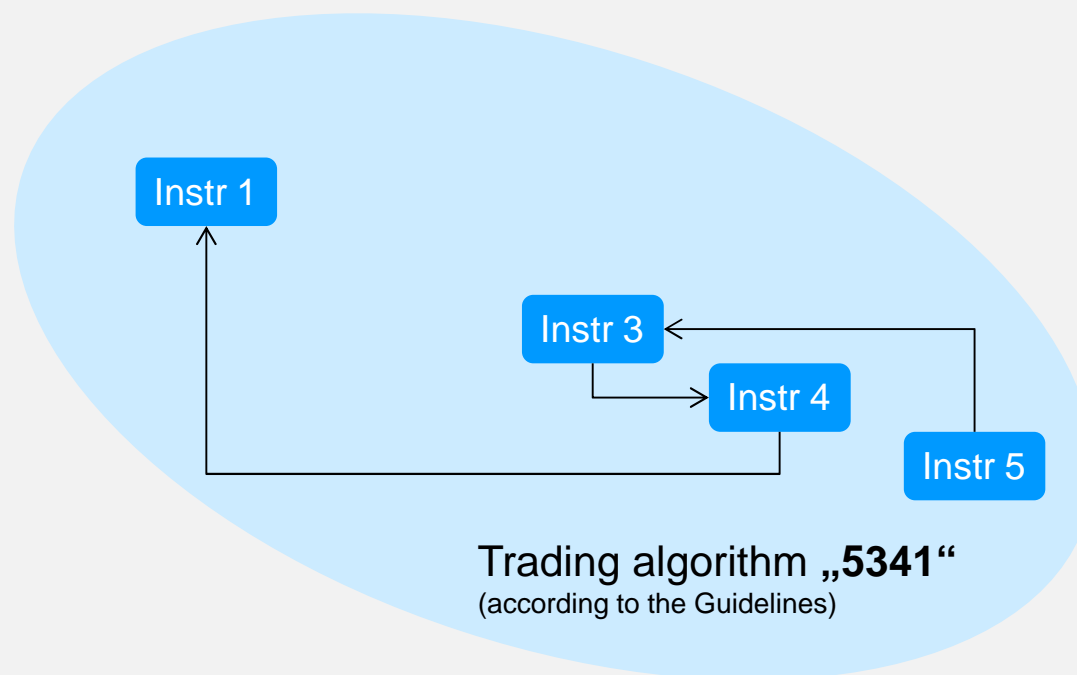


## Example 1.2

Assume participant A has an algo with 5 independent instructions which can interact with each other. This is illustrated in the picture below.

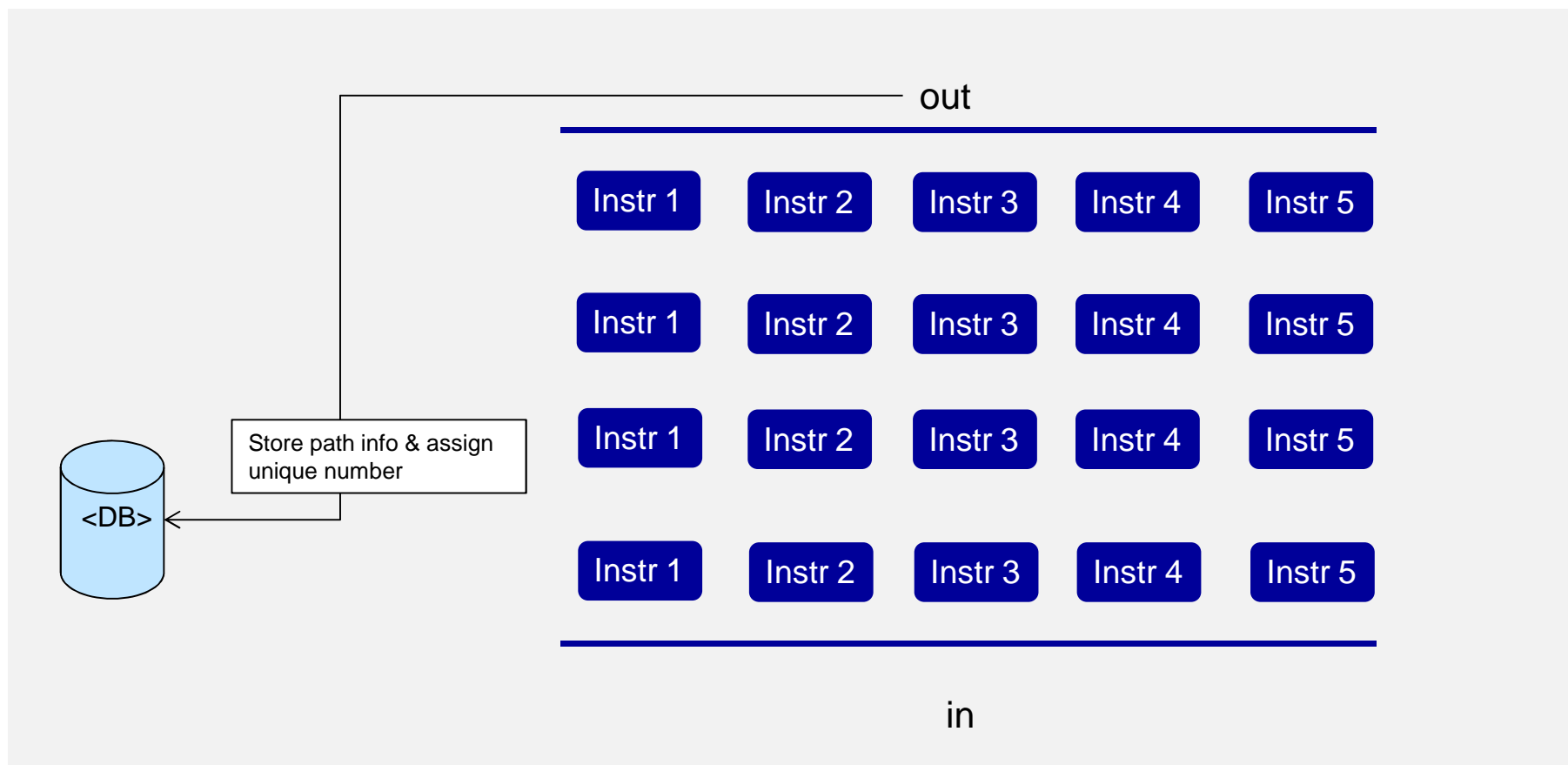
Possible flagging ...

**5341** would be the result from instruction 5 initiating the order creation, which is then passed and amended through instruction 3, instruction 4 and finally instruction 1 before entering into the Exchange EDP-System



## Example 2

Assume participant A has an algo with 5 independent instructions which can interact with each other – as illustrated in the picture below – whenever a new path is used he increases the number (on the fly).

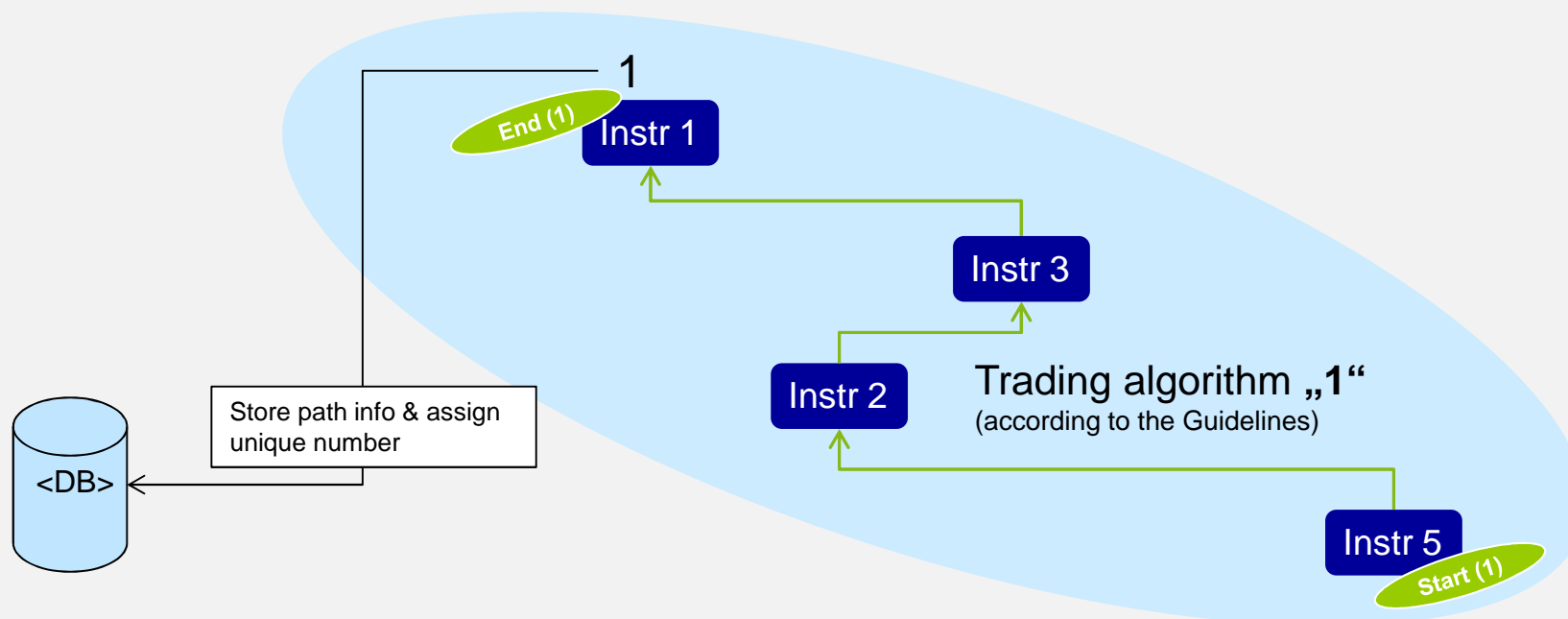


## Example 2.1

Assume participant A has an algo with 5 independent instructions which can interact with each other – as illustrated in the picture below – whenever a new path is used he increases the number (on the fly).

Possible flagging ...

- 1 Following the green arrow: Instruction 5 initiating the order creation, which is then passed and amended through instruction 2, instruction 3 and finally instruction 1 before entering into the Exchange EDP-System

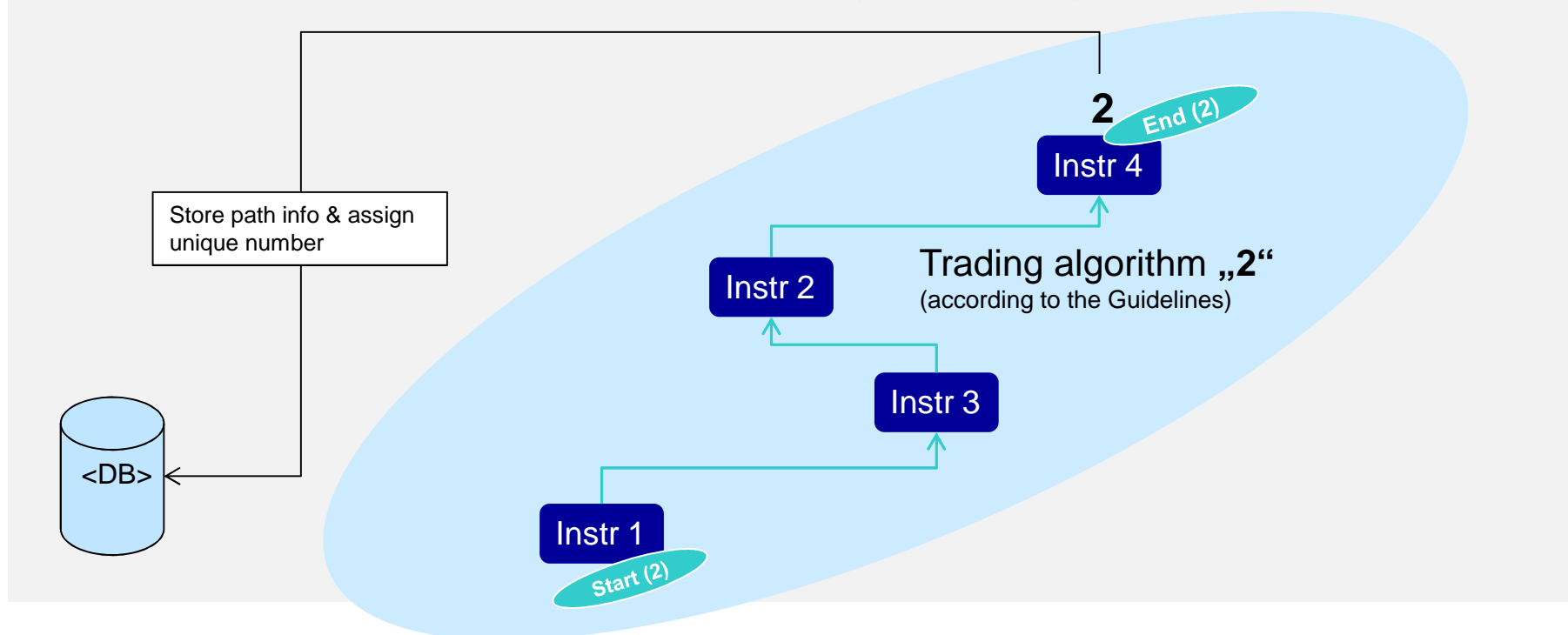


## Example 2.2

Assume participant A has an algo with 5 independent instructions which can interact with each other – as illustrated in the picture below – whenever a new path is used he increases the number (on the fly).

Possible flagging ...

- 2 Following the blue arrow: Instruction 1 initiating the order creation, which is then passed and amended through instruction 3, instruction 2 and finally instruction 4 before entering into the Exchange EDP-System



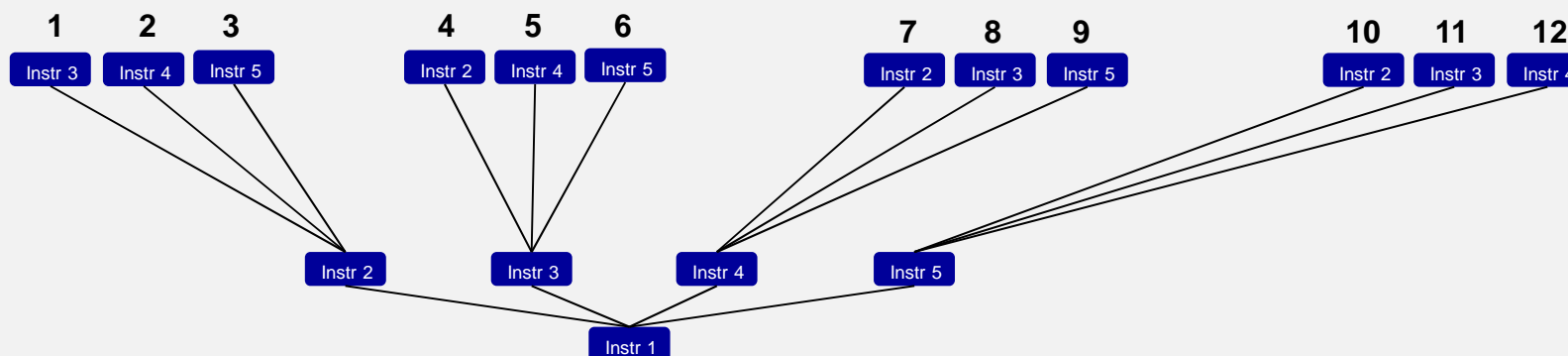


## Example 3

Assume participant A has an algo with 5 independent instructions which can interact with each other – as illustrated in the picture below – all numbers are assigned on a theoretical level at the setup.

Possible flagging ...

- 1 would be the result from instruction 1 initiating the order creation, which is then passed and amended through instruction 2 and finally instruction 3 before entering into the Exchange EDP-System
- 5 would be the result from instruction 1 initiating the order creation, which is then passed and amended through instruction 3 and finally instruction 4 before entering into the Exchange EDP-System
- 9 would be the result from instruction 1 initiating the order creation, which is then passed and amended through instruction 4 and finally instruction 5 before entering into the Exchange EDP-System

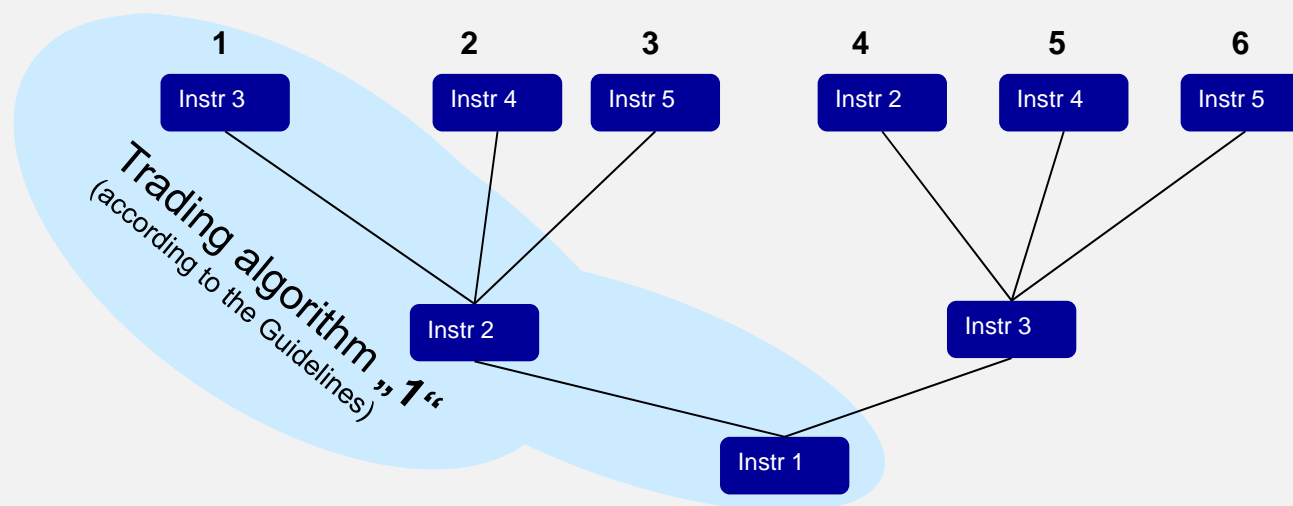


## Example 3.1

Assume participant A has an algo with 5 independent instructions which can interact with each other – as illustrated in the picture below – all numbers are assigned on a theoretical level at the setup.

Possible flagging ...

would be the result from instruction 1 initiating the order creation, which is then passed and amended through instruction 2 and finally instruction 3 before entering into the Exchange EDP-System



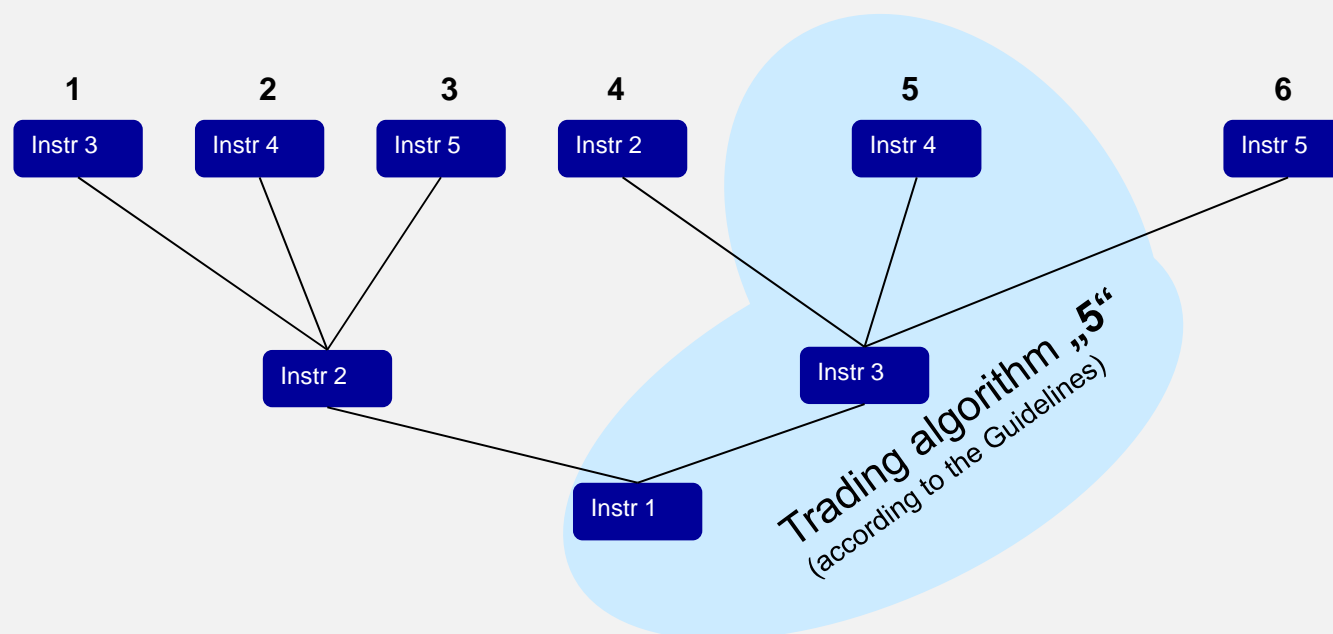
Any other combination of instructions would result in "different" trading algorithms

## Example 3.2

Assume participant A has an algo with 5 independent instructions which can interact with each other – as illustrated in the picture below – all numbers are assigned on a theoretical level at the setup.

Possible flagging ...

would be the result from instruction 1 initiating the order creation, which is then passed and amended through instruction 3 and finally instruction 4 before entering into the Exchange EDP-System



Any other combination of instructions would result in “different” trading algorithms

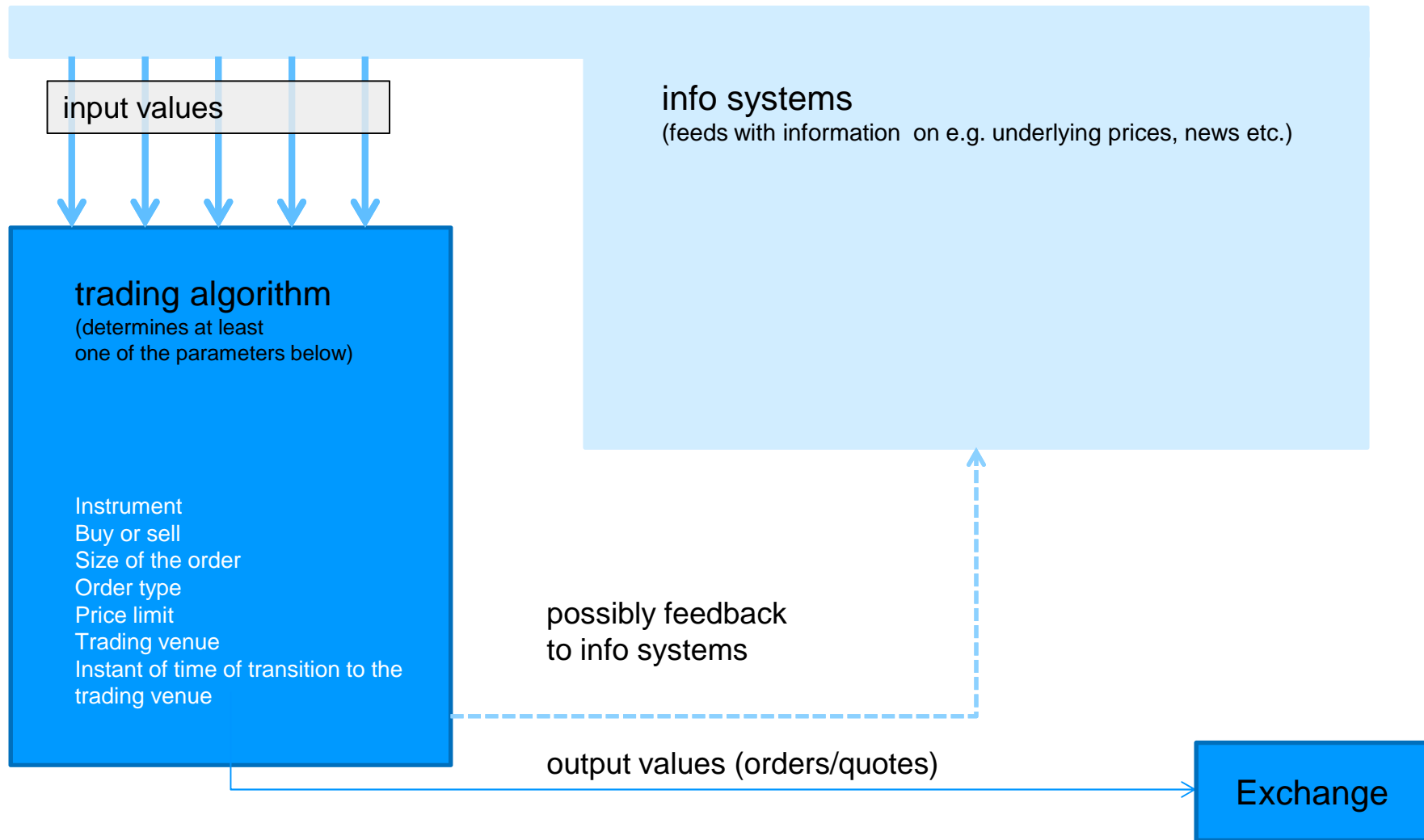
## Examples\* on what might constitute a different sequence of instruction (different RegulatoryID)

....As trading algorithm has to be identified the entire sequence of calculation steps (decision path), which effects that an order or its change or deletion at a respective point in time and in its respective form is entered into the trading system of the exchange. Thus, the identification obligation is referred to a sequence of instructions and not to its individual elements, even if the latter could separately be considered as independent algorithms..... \*\*

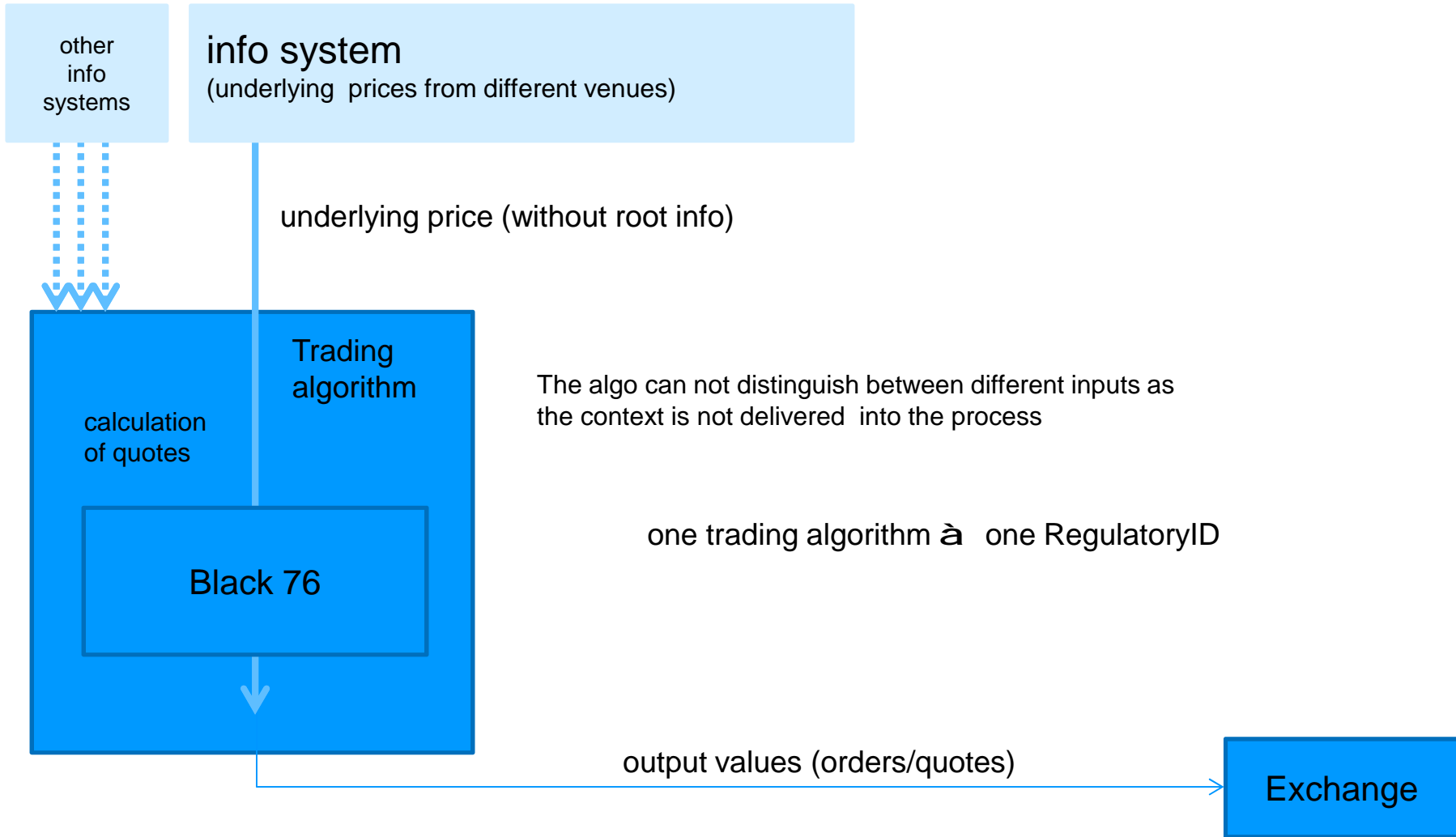
\*Note: Those examples are not legally binding and only represent a guideline

\*\* From Guidelines to the adherence to the requirement of the labelling of trading algorithms (as of December 20, 2013)

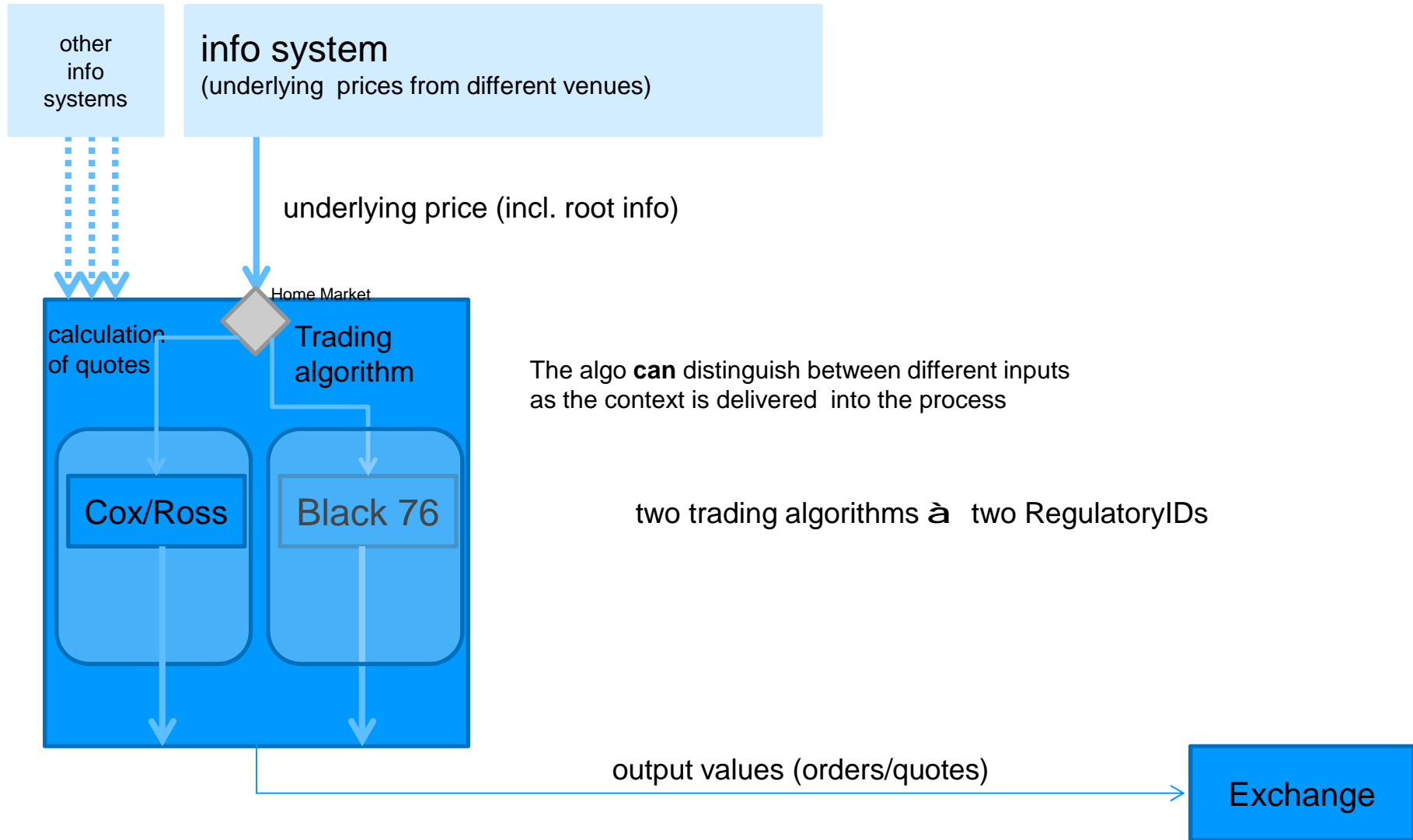
## General overview



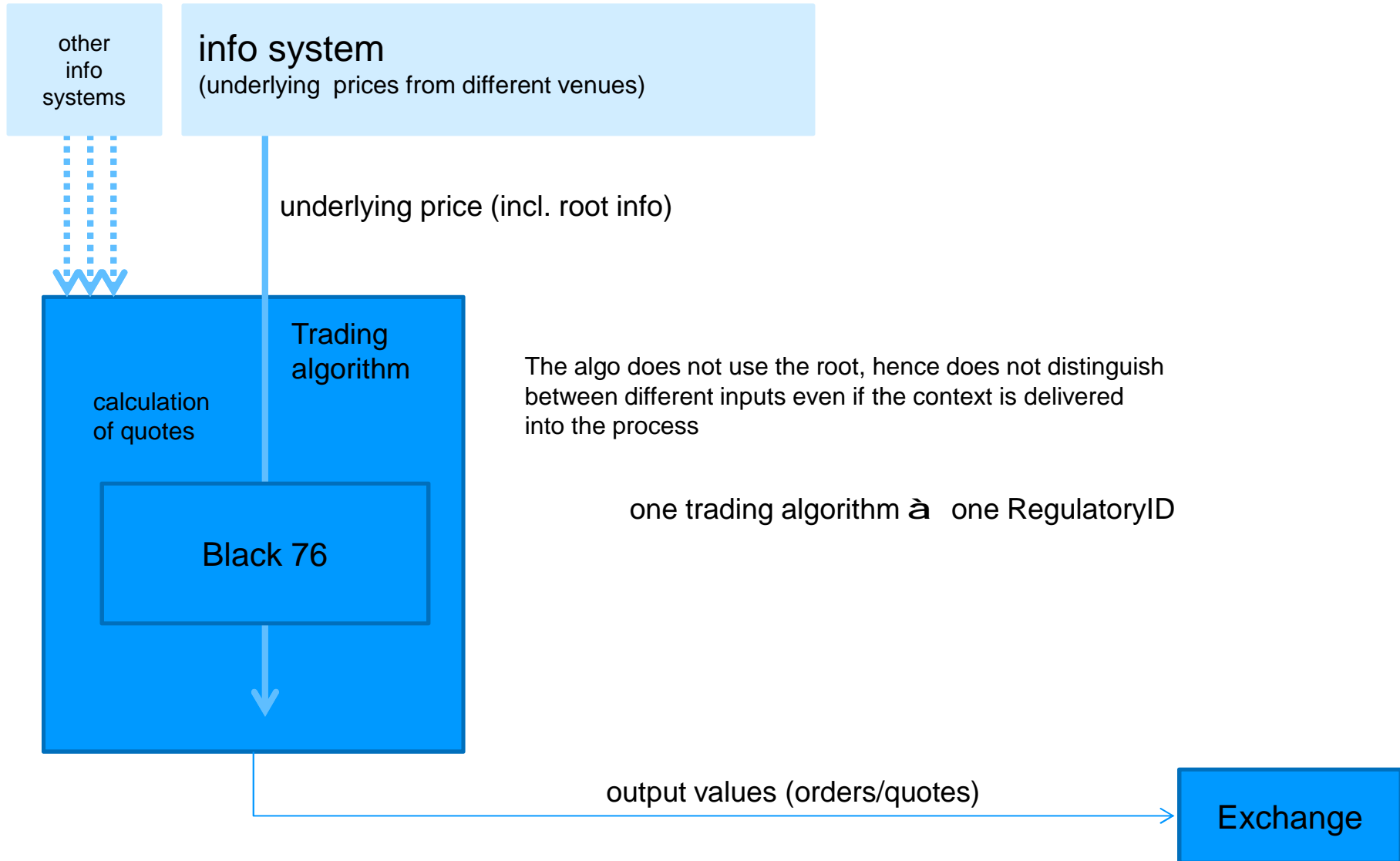
### Example 1.1



### Example 1.2

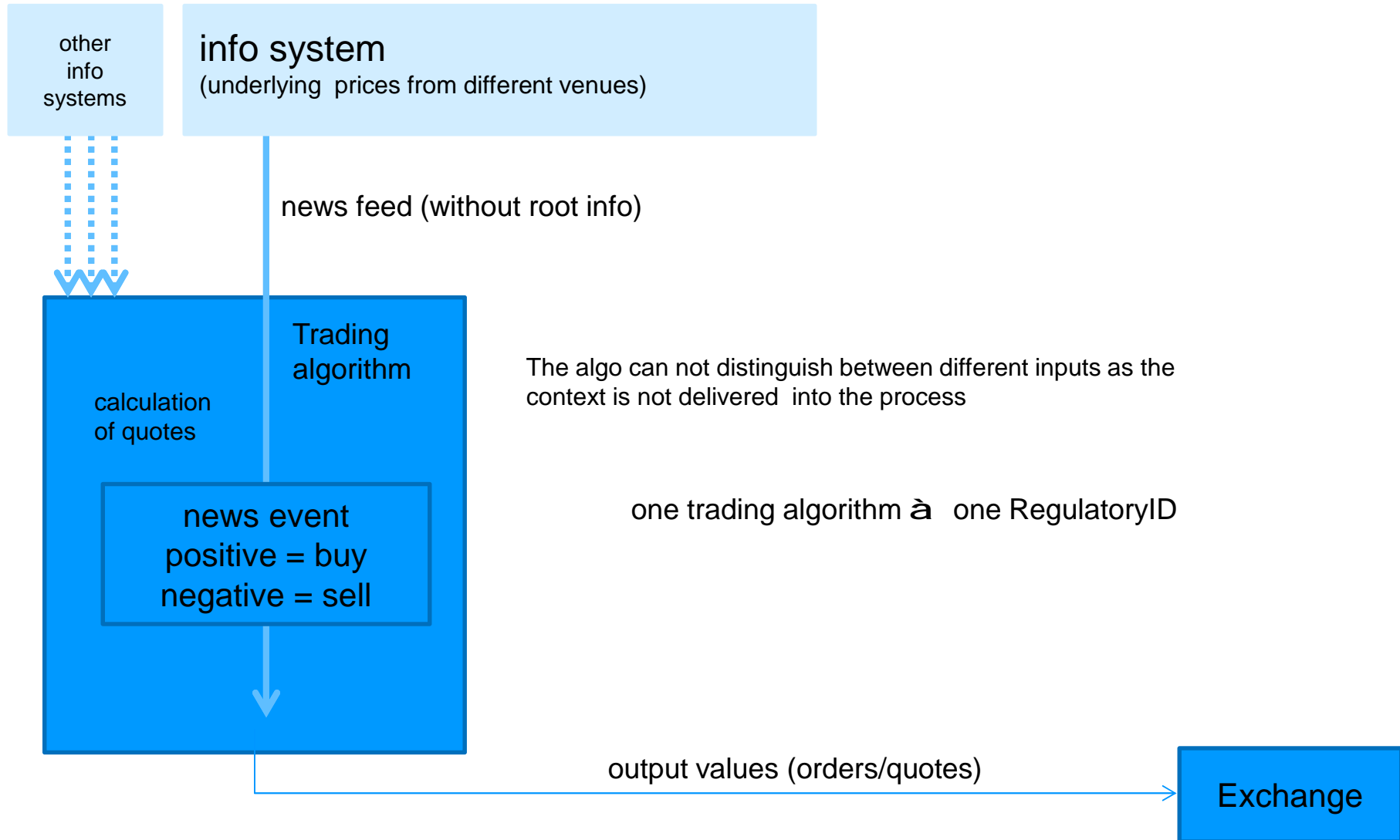


### Example 1.3

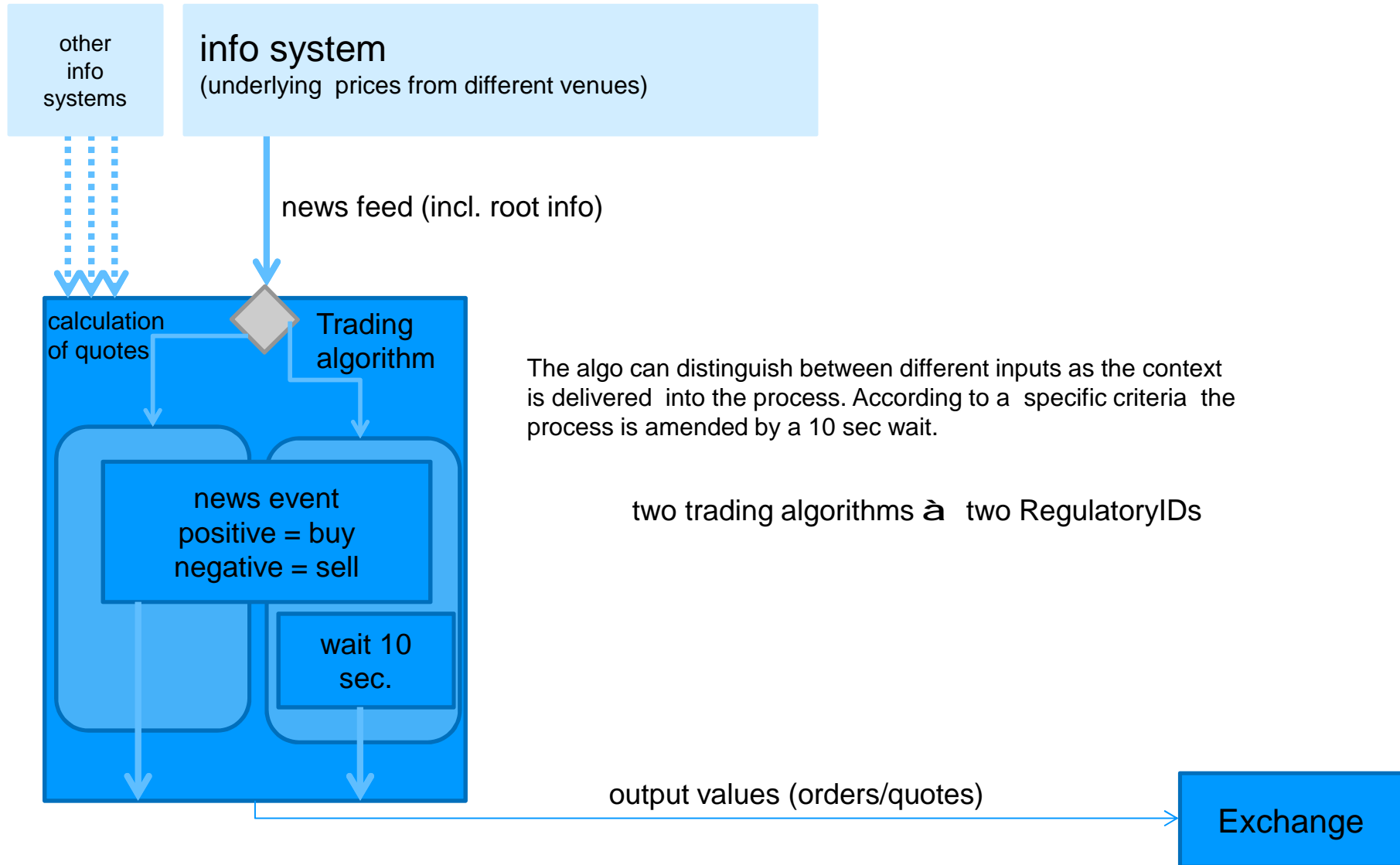




### Example 2.1



## Example 2.2





# Back-up



## Information Sources (1/2)

### **Exchange Rule of Frankfurt Stock Exchange, 72a: Identification of algorithmic orders and of trading algorithms**

- § German - [http://deutsche-boerse.com/dbg/dispatch/de/binary/dbg\\_nav/metanavigation/30\\_Regulations?object\\_id=84XHGZ360NSGDDE](http://deutsche-boerse.com/dbg/dispatch/de/binary/dbg_nav/metanavigation/30_Regulations?object_id=84XHGZ360NSGDDE)
- § English - [http://deutsche-boerse.com/dbg/dispatch/en/binary/dbg\\_nav/metanavigation/30\\_Regulations?object\\_id=84XHGZ360NSGDEN](http://deutsche-boerse.com/dbg/dispatch/en/binary/dbg_nav/metanavigation/30_Regulations?object_id=84XHGZ360NSGDEN)

### **Exchange Rule of Eurex, § 17a: Identification of algorithmic orders and of trading algorithms**

- § German - <https://www.eurexchange.com/exchange-de/ressourcen/regelwerke/136928/>
- § English - <https://www.eurexchange.com/exchange-en/resources/rules-regulations/138364/>

### **Guidelines to the adherence to the requirement of the labelling of trading algorithms (as of December 20, 2013)**

- § German - [https://wirtschaft.hessen.de/sites/default/files/media/hmwvl/hinweise\\_zur\\_erfuellung\\_der\\_verpflichtung\\_zur\\_kennzeichnung\\_von\\_handelsalgorithmen\\_13-12-20.pdf](https://wirtschaft.hessen.de/sites/default/files/media/hmwvl/hinweise_zur_erfuellung_der_verpflichtung_zur_kennzeichnung_von_handelsalgorithmen_13-12-20.pdf)
- § English - [https://wirtschaft.hessen.de/sites/default/files/media/guidelines\\_to\\_the\\_adherence\\_to\\_the\\_requirement\\_of\\_the\\_labelling\\_of\\_trading\\_algorithms\\_13-12-20.pdf](https://wirtschaft.hessen.de/sites/default/files/media/guidelines_to_the_adherence_to_the_requirement_of_the_labelling_of_trading_algorithms_13-12-20.pdf)

## Information Sources (2/2)

### XETRA Circulars

- § 099/13 Amendments to Exchange Rules for the Frankfurt Stock Exchange regarding flagging of algorithms and order-to-trade ratios
- § 077/13 Flagging of Orders generated through algorithmic Trading
- § 073/13 Further Information on Implementation of single Elements of the German High Frequency Trading Act (HFT)
- § 045/13 German High Frequency Trading Act has become effective
- § 034/13 HFT Bill: Information on Order/Trade Ratio, Excessive System Usage Fees and flagging of Trade Algorithms

For download, follow links:

German -

[http://xetra.com/xetra/dispatch/de/kir/navigation/xetra/300\\_trading\\_clearing/100\\_trading\\_platforms/100\\_xetra/950\\_hft](http://xetra.com/xetra/dispatch/de/kir/navigation/xetra/300_trading_clearing/100_trading_platforms/100_xetra/950_hft)

English –

[http://xetra.com/xetra/dispatch/en/kir/navigation/xetra/300\\_trading\\_clearing/100\\_trading\\_platforms/100\\_xetra/950\\_hft](http://xetra.com/xetra/dispatch/en/kir/navigation/xetra/300_trading_clearing/100_trading_platforms/100_xetra/950_hft)

### EUREX Circulars

- § No. 216/2013: Information on algorithm flags and identification (“algo-flagging”)
- § No. 164/2013: HFT Act: Further information on implementation of various elements
- § No. 099/2013: German High Frequency Trading Act has become effective
- § No. 077/2013: HFT Bill: Information on order/trade ratio, excessive system usage fees and flagging of trade algorithms
- § No. 073/2013: Information on the German High Frequency Trading Bill
- § No. 052/2013: German High Frequency Trading Bill passed

For download, follow links:

German - <https://www.eurexchange.com/exchange-de/ressourcen/circulars/>

English - <https://www.eurexchange.com/exchange-en/resources/circulars/>

### BAFIN FAQs

German - [http://www.bafin.de/DE/DatenDokumente/FAQ/HFT-Gesetz/hft-gesetz\\_node.html](http://www.bafin.de/DE/DatenDokumente/FAQ/HFT-Gesetz/hft-gesetz_node.html)

English - [http://www.bafin.de/EN/DataDocuments/FAQ/HFT-Gesetz/hft-gesetz\\_node.html](http://www.bafin.de/EN/DataDocuments/FAQ/HFT-Gesetz/hft-gesetz_node.html)

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