Attachment 1. Activities complexity calculation

To calculate complexity, the Functional Cognitive Complexity method is used (Formula 7). This method is applied to flowcharts to assess implementation complexity and to specific parts of the flowchart (marked in green) to evaluate modification complexity. According to the cognitive functional complexity algorithm [50], the calculation consists of several stages as follows:

* Create flowcharts for the algorithm.
* Calculate the cognitive functional complexity for the implementation of the activity.
* Calculate the cognitive functional complexity for the modification of the activity.

A.1.1 Classical CQRS Command process activities

Create a Command.

A diagram of a command

AI-generated content may be incorrect.

Figure 8: Classical CQRS Create a Command Flowchart

Implementation complexity:

Modification complexity:

Validate a Command

A diagram of a command

AI-generated content may be incorrect.

Figure 9: Classical CQRS Validate a Command Flowchart

Implementation complexity:

Modification complexity:

Route a Command

A diagram of a command

AI-generated content may be incorrect.

Figure 10: Classical CQRS Route a Command Flowchart

Implementation complexity:

Modification complexity:

Fetch an Aggregate

A diagram of a event

AI-generated content may be incorrect.

Figure 11: Classical CQRS Fetch an Aggregate Flowchart

Implementation complexity:

Modification complexity:

Update an Aggregate’s state

A diagram of a process

AI-generated content may be incorrect.

Figure 12: Classical CQRS Update an Aggregate’s state Flowchart

Implementation complexity:

Modification complexity:

Save an Aggregate

A diagram of a snap shot

AI-generated content may be incorrect.

Figure 13: Classical CQRS Save an Aggregate Flowchart

Implementation complexity:

Modification complexity:

Dispatch events

Each time we add a new process to the dispatcher, we do not implement a loop; instead, a new event condition is simply added to the existing list. Therefore, in complexity calculation, the *iteration* block is considered a *branch* in this case.

A diagram of events

AI-generated content may be incorrect.

Figure 14: Classical CQRS Dispatch events Flowchart

Implementation complexity:

Modification complexity:

Route an Event

A diagram of a event

AI-generated content may be incorrect.

Figure 15: Classical CQRS Route an Event Flowchart

Implementation complexity:

Modification complexity:

Handle an Event (Update projection)

A diagram of a projector

AI-generated content may be incorrect.

Figure 16: Classical CQRS Handle an Event (Update projection) Flowchart

Implementation complexity:

Modification complexity:

Notify clients

A diagram of a diagram

AI-generated content may be incorrect.

Figure 17: Classical CQRS Notify clients Flowchart

Implementation complexity:

Modification complexity:

A.1.2 mCQRS Command process activities (which differ from the classic CQRS)

Fetch an Aggregate

A diagram of a software process

AI-generated content may be incorrect.

Figure 18: mCQRS Fetch an Aggregate Flowchart

Implementation complexity:

Modification complexity:

Apply events onto an Aggregate

A diagram of events and events

AI-generated content may be incorrect.

Figure 19: mCQRS Apply events onto an Aggregate Flowchart

Implementation complexity:

Modification complexity:

Save an Aggregate

A diagram of a flowchart

AI-generated content may be incorrect.

Figure 20: mCQRS Save an Aggregate Flowchart

Implementation complexity:

Modification complexity:

Handle an Event (Update projection)

A diagram of a projector

AI-generated content may be incorrect.

Figure 21: mCQRS Handle an Event (Update projection) Flowchart

Implementation complexity:

Modification complexity:

A.1.3 Query process activities

Create a Query

A diagram of a process

AI-generated content may be incorrect.

Figure 22: Create a Query Flowchart

Implementation complexity:

Modification complexity:

Validate a Query

A diagram of a workflow

AI-generated content may be incorrect.

Figure 23: Validate a Query Flowchart

Implementation complexity:

Modification complexity:

Fetch a Projection

A diagram of a process

AI-generated content may be incorrect.

Figure 24: Fetch a Projection Flowchart

Implementation complexity:

Modification complexity:

Map a Projection to a DTO

A diagram of a projector

AI-generated content may be incorrect.

Figure 25: Map a Projection to a DTO Flowchart

Implementation complexity:

Modification complexity:

Return a DTO

A diagram of a customer

AI-generated content may be incorrect.

Figure 26: Return a DTO Flowchart

Implementation complexity:

Modification complexity: