



**Procurement by Competitive Dialogue for event streaming HUB,
supporting tools and associated services**

Case ID: 21/02477

Part II – Descriptive Document

Table of contents

1. Introduction	3
1.1 Background Information Norsk helsenett SF	3
1.2 Current national services from Norsk helsenett SF	3
2. About Samhandlingsplattform (SHP)	4
2.1 SHP system design	4
2.2 Basic principles for the collaboration HUB at NHN	4
3. High level description of needs	5
3.1 User groups	5
3.2 Managing data and flow	6
3.3 Security	7
3.4 Where it runs	7
4. Support, training and knowledge	7
5. Commercial	8
5.1 Pricing models for deliverables	8
5.2 Discount models	8
5.3 SLA and compensation	9
5.4 Currency	9

1. Introduction

1.1 Background Information Norsk helsenett SF

The national health network enterprise, Norsk helsenett SF (named NHN in this document) is a state enterprise organized under the Ministry of Health and Care Services. NHN offers technology solutions enabling communication and collaboration among providers of health and care services, both in public and private sector. NHN is the national unit for the development and operation of the ICT infrastructure for the health and care services in Norway. NHN provides efficient and secure electronic exchange of patient information within the health and care services providers like general practitioners, hospitals, nursing homes, pharmacists, dentists, and others.

NHN provides a stable and secure network for the Norwegian health sector to communicate and exchange vital patient information through a variety of services. Originally NHN's sole role was as the provider of the national physical network for the health sector, providing communication infrastructure in a robust and redundant way. Today NHN's scope and tasks have broadened including digital services widely used by professionals in health and care as well as digital communication services for Norwegian citizens and patients.

The health network is what connects governmental health agencies, authorities and health and care providers at local, regional, and municipal level together. The health network enables digital interaction between all the stakeholders in the health sector. It is now an online community consisting of more than 7000 members. The health network provided by NHN is the health and care sector's digital nervous system.

1.2 Current national services from Norsk helsenett SF

Message exchange offers health network members secure transport and delivery of medical and health information messages. In 2019, more than 210 million messages were exchanged. Hospitals are the heaviest users of today's membership services. NHN's national services acts as the Health Information Exchange in the health network. Some types of messaging are mandatory to be used by the members, IE to enable care processes involving shifts of responsibility for the patient etc. The principal technology is based on emailing and webservice protocols with national XML information models.

NHN provides the national e-prescription service used by all GPs and pharmacies as well as hospitals.

A national core medical record, primarily for emergency care support, provides a portal for health professionals to view and update prioritized medical and health information about patients.

The citizen/patient portal "helsenorge.no" is the national information hub for citizens and a communication platform for patients for both open health information and specific information linked to individuals.

There are several supporting services for code-sets and terminology, demographics and general citizen and health service information as well as patient privacy, also provided by NHN or by national agencies, hospitals and local governments communicated through the national health network.

2. About Samhandlingsplattform (SHP)

SHP is short for "Samhandlingsplattform". Notably "samhandling" translates to "collaboration" in English.

SHP is a division of NHN. It has a commitment to establish and facilitate an ecosystem of collaboration between suppliers and actors, so that they can achieve their goals.

SHP is organized in several teams that creates and maintains services needed for this ecosystem. Internally, these teams are referred to as "delivery teams". To facilitate collaboration between teams and the services they create internally, we have established SHP-NAV.

SHP-NAV ("nav" translates to "hub" in English) is an important component in SHP's system design (this is described in more detail below). Its design must comply with our system design and should help other services and teams using SHP-NAV to also comply with it.

In sum, SHP-NAV helps SHP achieve its mission of **"collecting data and making it available"**. Another perspective is that SHP-NAV enables SHP to keep data secure and make it accessible to those who need it, when they need it.

2.1 SHP system design

To better understand why we are creating the SHP-NAV, it's helpful to be aware of our guiding design principles. Therefore, we include and briefly discuss them here. They make up the foundation for how we organise, create, and interact with our teams and services, both in everyday practice and when working on more abstract cases.

With our system design, we work towards our services being:

- Active/Active, so that our systems can be highly available (HA), through having multiple redundant instances that can fail over to each other
- reliable, so that it ensures data is consistent, not lost, and available across geolocations if some part of the nation should have issues
- easy to use in parallel by many systems, both individual and for sharing data between them
- performant, so that our critical services can serve up information to external consumers with close to real time needs (e.g. swiftly populate websites used by health care personnel)
- easy to use securely so that for instance patient information is only accessed by those that are supposed to have access to it

2.2 Basic principles for the collaboration HUB at NHN

The overall purpose of the national collaboration services is to enable health providers with the most updated patient information at the point of care. Improved sharing of patient information leads to better grounds for clinical decisions and ultimately, optimized treatment and care for each individual patient.

NHN have identified a preliminary set of principles to ensure optimized conditions for data collection and data provisioning across multiple business services and needs, in particular patient-encounters across the whole spectrum of treatment and care variation:

- Any type of Data
 - Events, structured or unstructured, any format and encrypted if needed
- Data security
 - Data integrity, availability, confidentiality and robust
- High availability
 - Data always available, stored for as long as needed in multiple regions
- Efficiency
 - High throughput and low latency
- Streaming
 - Modern data management technology
- Tools
 - Productivity and clarity in management of monitoring data
- Best practices by industry experts
 - Long term relationship
- Tested and proven technology
 - Access to reference customers and community

3. High level description of needs

SHP-NAV is currently built on a community version of Apache Kafka. The implementation is hosted on-prem. We are currently using only one cluster, but we see the need to have a multi-cluster setup to realize our ambitions for the SHP-NAV. Our development teams mainly use Java and .NET C#.

In this chapter we will describe needs that we want to acquire products and services to cover. The needs arise from

- various user groups and their needs
- the needs surrounding management of data and flow
- the need for security and secure operations
- the environment we operate the Kafka cluster(s) in
- a general need for support, training, and knowledge

3.1 User groups

At the moment we have worked mainly with 3 ways to use the SHP-NAV:

- Operations
- System management
- Application developer (DevOps) teams' usage

These usage patterns have been seen across teams in SHP, but also across different parts of the organization. We have found no deterministic mapping between usage patterns and different types of teams like for instance operations teams. We have cases of operations teams performing systems management, as well as examples of delivery team doing operation.

3.1.1 Operations

The Operations part of the organization has a 24/7 SLA and need to observe, monitor and

handle incidents outside of regular working hours. Our Operations teams do not handle any “internal”/application management tasks, such as maintaining access control and topics. What they do handle is the surrounding infrastructure, for instance monitoring resource usage, hardware, network, and environment setup.

3.1.2 System management

There will be one group that has an overall responsibility for the implementation and usage of the system. There is a joint responsibility between those working with operations and those working with system management to ensure the accessibility, security, and usage of the system.

We think that typical tasks for this group will be:

- Access management, creation of groups for other teams that need access, and removing old groups when they no longer need/should have access
- Governing of topics, connectors, consumer groups and other producers and consumers
- Control and monitor the flow of data internally and across cluster borders, for all our clusters
- Aid other teams in implementing usage of SHP-NAV
- Create and maintain a knowledgebase for best practices and general use of SHP-NAV
- Keeping the system alive and healthy
- Taking a proactive role in ensuring that SHP-NAV performs and is utilized optimally

3.1.3 Developer (DevOps) teams’ usage

Most of the hub’s users will be organized in one of the developer teams in SHP. They are responsible for producing services in a way that implement the functional needs in a way that reduces the overall risk in the platform.

The services produce and consume from topics. An important principle in our systems design is that services always have the information needed to do the intended job, regardless of the state outside of the service. So multiple services might access the same topic, and not in a correlated manner, and be able to work independently of one another.

Each connecting team in SHP must be able to set up their own topics, consumption and monitor their usage. They are the real users of SHP-NAV. Their usage also needs to be completely separated from the other teams.

Although the system managers give the teams a “space” to work with, each individual team with services connecting to SHP NAV should be able to:

- Manage team members, and give services access
- manage topics and schemas they own and create new when needed
- Give other teams access to consume the topics they produce to
- Handle all their security issues
- Set up usage of SHP-NAV in their CI/CD-pipeline

Automation and infrastructure-as-code is important to all our teams.

3.2 Managing data and flow

Control of, monitoring and insight to data usage is a central responsibility of SHP-NAV.

- Support and implement NHN's principles of data: confidentiality, Integrity, accessibility and robustness
- Audit-log of changes and usage of the system
- Dual-control to reduce risk of data loss from destructive changes in the system
- Search in and access data for all teams
 - o Teams must only access data they have access to
 - o Masking or hiding sensitive information in the data is a good feature
 - o Audit-log of data access is a must
 - o Encrypted data is not decrypted when viewed
- Visualise data flow in the system in a way that gives an overview. And possibility to see details when needed.
- Alert when things are out of the ordinary

3.3 Security

We are currently using mTLS for connecting services. We want to automate as much as possible in all our processes. We want certificates to be as short lived as possible.

Support for integration to a vault solution, so that password, certificates and other secrets can be stored securely.

Data is default not encrypted at rest now. We need to be able to handle encryption at rest. And this should be integrated in how secrets and certificates are handled.

Handling Users and Group memberships must be simple to reduce the possibility of mistakes. Integration to other systems is not mandatory but nice. And it should be as granular as possible, to critical resources.

Dual-control is a functionality that implements a sort of peer-review. It reduces the possibility that one person can do irreversible destructive changes to the system, in that a change must be confirmed by another user with equal or higher rights.

All systems that handle sensitive data in NHN, must have a structured audit log.

3.4 Where it runs

The solution needs to run in our datacentres. We have multiple datacentres in multiple regions. Our current implementation runs in Docker on Linux VM's.

Data must with ease flow and be replicated in all regions and datacentres. Monitoring and overview of this flow must be visual and easy to understand.

In the future we will move into Kubernetes. Automating as much as possible of operations and setup, to handle the elasticity needed in the future. We need expert advice on how we can accomplish this. And reviews of the implemented solution, to help us improve and evolve.

4. Support, training and knowledge

As an organisation we are not experts on event and data streaming technology. We need access to this knowledge, someone to collaborate with to implement our system design.

The organisation has a need for training, to help us utilize streaming technology according to best practices. There is also a need for guidance when migrating the organizations legacy

solutions to use streaming technology.

The goal is to become self-sustained and confident in using and implementing SHP-NAV, in a way that helps us implement our system design. The platform that is being made should strive to achieve best practices for an async distributed system with close to zero downtime and loss of data.

The organization needs training, guidance, and support when installing, maintaining, and upgrading the SHP-NAV.

There is also a need for training, guidance, and support in how to use and how to improve usage of the SHP-NAV.

5. Commercial

NHN needs to comply with requirements related to our position as a public sector organisation.

In the early stages of dialogue phase, the need to understand the vendors flexibility and adaptability to different types of compensation formats and pricing plans will guide the requirements we describe to the vendor candidates.

Examples of potential information that will be part of the needed information package from the potential vendors can include:

5.1 Pricing models for deliverables

Candidates should consider different options for compensation formats related to the offered products and services. In the dialogue phase, NHN needs to consider different options to be able to optimize the pricing mechanisms to cover both short- and long-term needs. Flexible and adaptable pricing models, yet simple and understandable, will be favoured by NHN.

All pricing shall be in NOK, ex. VAT.

Preliminary list of pricing elements:

- Software platform
- Software tools
- Implementation project price models
- Pricing of "out-of-the-box" integrations to specific 3. party services (Azure AD etc.)
- Integration made-to-order
- Maintenance and Support
- Consulting services in bulk and by hourly rates
- Best-price guarantee – benchmarking
- Subscription versus perpetual license
- Fixed price versus target pricing (implementation)

5.2 Discount models

In the competitive dialogue, vendor candidates are encouraged to introduce incentives for expanded use of the contracted products and services.

Elements to consider:

- Volume based models
- Time based models
- Performance based models (less support incidents – less cost)
- Stepwise models

5.3 SLA and compensation

Given the criticality of the collaboration HUB as a vital component in processes of patient treatment and care, NHN needs to secure the highest possible standards for availability of services to the end-users depending on the information it provides to them in their work.

Vendor candidates will be challenged to suggest levels of SLAs and compensations for both products and services provided under contracts resulting from this procurement.

Elements to consider are:

- SLA levels for availability of the delivered software
- SLA levels for maintenance and support services
- List of assumptions to be managed by NHN to enable the SLA
- Compensation when breaches of SLA occur
- Timeframes and metrics for SLA determination
- Other elements

5.4 Currency

All invoicing under this procurement and contracts are preferred by NHN to be in Norwegian Kroner (NOK). Practicalities regarding mechanisms for payment will be a topic under the dialogue.