

KNOWLEDGE-BASED MANAGEMENT OF THE HELSINKI TRAVEL AND TOURISM UNIT

REQUIREMENT SPECIFICATION

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Contents

Contents	2
Background and goals of the specification work	3
Knowledge-based management of the Helsinki Travel and Tourism Unit	3
Current situation, development needs and challenges	4
City strategy work and objectives	4
Data quality and availability	4
Development of the industry	5
Cooperation within the industry	5
The overall picture of knowledge-based management of tourism	5
Terminology	7
Knowledge-based management tools	8
Requirements of the system architecture	8
General requirements	8
Information acquisition and integrations	9
Storage and processing of data	9
Data visualisation	10
Data flows	10
Functional requirements	11
User groups and access rights	11
Using and sharing of information	12
Information needs	12
Introduction and utilisation of data sources	13
Knowledge-based management operating model	14
Management processes	14
Important stages in the management process include	14
Casting	14
Utilisation of information	14
Development	15
Training and continuous learning	15
Phases of the development project	16
Tendering phase	16
First phase of implementation (MVP implementation) includes	17

Second phase of implementation – Version 1 of the overall system includes	17
Continuous maintenance and development	17
Budgeting	17
Phases of the development project in terms of information needs and information sources	18
Possible solution options	23
APPENDIX 1. INFORMATION NEEDS	24

Background and goals of the specification work

Helsinki is by far the most popular tourist destination in Finland. The city's Travel and Tourism Unit is responsible for developing the prerequisites for tourism as a whole in cooperation with various stakeholders. Tourism, tourists, travel and service providers involve a huge amount of data, which can be used to make informed decisions and develop measures.

Knowledge-based management is seen as one of the most important areas of development in the Helsinki Travel and Tourism Unit. The topic has been explored and defined in many contexts, but no clear picture of the objectives and the measures required has been made so far.

The purpose of this specification document is to summarise previous views and reports, as well as the thorough reflection based thereon, into a coherent and concrete requirement specification that can be used as a guideline for development projects.

Knowledge-based management of the Helsinki Travel and Tourism Unit

The role and importance of knowledge-based management in the development of the tourism industry is summed up in the vision and mission:

Vision

Helsinki Travel and Tourism is managed based on easy-to-use information.

Mission

Varied and up-to-date data is used in the management of Helsinki Travel and Tourism, based on which the implementation of the strategy can be monitored and guided. The data has been collected in a single system, from which it can be used extensively by different units, and it is also shared with other tourism areas, companies and stakeholders. At the same time, knowledge-based management methods and tools are being actively developed in

cooperation with stakeholders in order to be prepared for new steps in the future, such as the use of artificial intelligence.

Current situation, development needs and challenges

The totality of knowledge-based management is enormous. Because it affects all industries and functions, it has not been defined with commonly used delimitations or ready-made solution models. An overall view must be built of each organisation based on its own starting points and goals.

Helsinki Travel and Tourism has utilised tools and processes of knowledge-based management, but the operations have not been organised and responsibilities have not been systematically assigned. Various sources of information are already being exploited widely but in a fragmented manner without uniform practices. The data is scattered across different systems, to which not all the necessary persons may have access.

- Due to the above, a clear model, common tools and operating methods are desired for knowledge-based management. In order to achieve this goal, we need to understand the challenges involved.

City strategy work and objectives

The City of Helsinki has only recently undergone a major organisational change. As a result, the role and responsibilities of the various units have not yet been fully clarified. At the same time, the objectives and metrics of these units and activities have not yet been definitively defined.

With regard to travel and tourism, the strategic objectives are defined as follows:

- Helsinki is an attractive tourist destination.
- Helsinki is the world's most sustainable tourist destination.
- Helsinki is the world's smartest tourist destination.

These objectives also serve as the guiding ideas for setting goals for knowledge-based management.

Data quality and availability

Tourism-related data is generated in different environments and has different origins. In practice, the data is offered in very different formats, such as PDF files, as an automated feed, or via an application programming interface (API) as a direct transfer.

In addition, the frequency of data available may be very different. For example, accommodation reservation data is updated in real time in the API, while employment statistics are updated once a month.

Some of the data used may be freely available for all through open interfaces, but some other data may require a large investment in the right to access the data.

- Harmonisation of all data is therefore very laborious, even impossible, and perhaps not necessary at all. Data as a term cannot represent all available information – in each case, it is necessary so specify the type of information, where it was obtained, in what format and how frequently.

Development of the industry

The rapid development of digitalisation has a direct impact on the tools and methods of knowledge-based management. In the development work, it must be understood that new sources of information, methods and tools enter the market at an accelerating pace.

- Development projects must take into account flexibility when the surrounding situation changes. However, it is also necessary to be able to define short-term objectives in order to achieve concrete results.

Cooperation within the industry

In the tourism industry in Finland, other tourism regions and companies are also developing their own knowledge-based management tools and methods. Visit Finland invests heavily in knowledge-based management, and in connection with this definition work, Visit Finland's knowledge-based management model and related plans have been comprehensively studied.

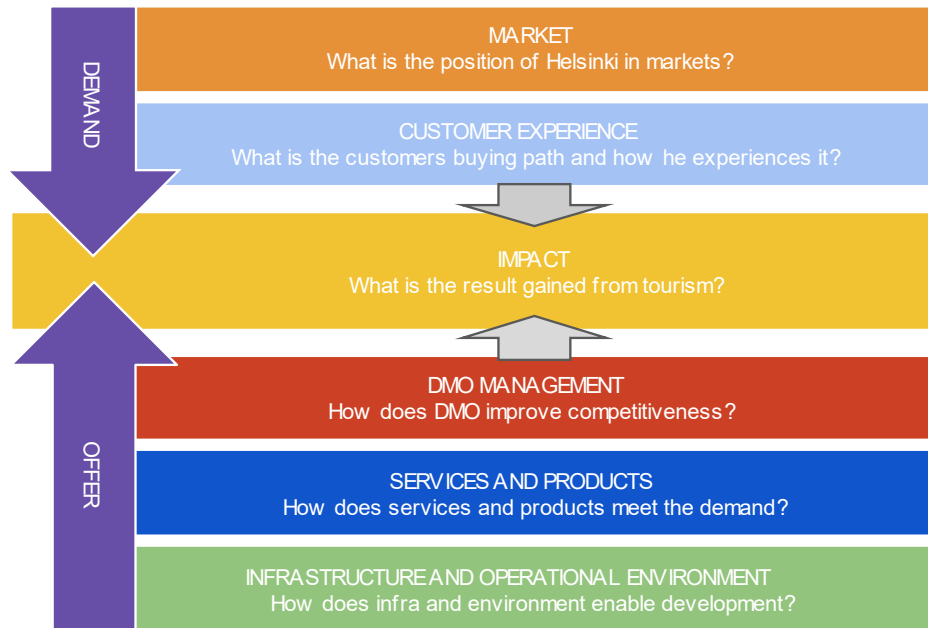
In cooperation with other operators, costs and experiences can be shared. At the same time, transparency of activities can be implemented, which is particularly important with regional stakeholders.

- The possibility and means of easily sharing information with other operators in the industry must be taken into account in system development.

The overall picture of knowledge-based management of tourism

Tourism is a global business whose ecosystem includes a wide range of actors and information sources. From the management point of view, it is essential to find logical links between the information to be processed and the impact of the decisions to be made on its basis on practical measures.

The figure below (Figure 1) structures the whole from the perspective of the regional tourism organisation:



What is the impact of tourism on income and employment?

Figure 1. The interaction between tourism demand and supply determines the impact of tourism.

Impact

The impact of tourism arises from the interaction between supply and demand. The result from tourism received by Helsinki is realised when the region can offer services which tourists clearly need. The positive manifestation of this result is, for example, the money that tourists leave in the region, and the opposite is the carbon footprint of these tourists, as well as the construction of the infrastructure required for growing tourism.

Supply

Supply is realised through a combination of three elements:

- The regional **infrastructure and operating environment** create the basic conditions for the creation of tourism services. This includes, for example, accommodation capacity, traffic arrangements and possible regulations and restrictions of society, for example, concerning restaurant operations.
- The **services and supply** reflect the concrete services provided to tourists. How many restaurants are there, does their selection meet the habits and needs of tourists?
- The **management of the regional organisation** includes all the measures and choices that are taken to develop the tourism industry.

Demand

Demand can be viewed from two perspectives:

- The **market** reflects the global tourism ecosystem, where Helsinki is a destination competing with other destinations. Global booking channels and software platforms through which travellers receive and share information about destinations and their experiences are embedded in the ecosystem.
- The **customer experience** brings together the customer's entire path from dreaming of a trip, to planning and to buying, and through the experience itself to sharing experiences.
 - In this specification work, the described framework is used to structure different information needs and entities.

Terminology

The knowledge-based management terms used in this document are listed and explained below.

Table 1. Key terms of knowledge-based management.

Information window	a visual user interface containing useful information generated from different kinds of data
Processing of information	a chain of measures in which raw data is processed into a format suitable for the information window
Knowledge-based management operating model	describes how the City of Helsinki's Travel and Tourism Unit implements the tool, machine and information windows by selecting the most suitable data materials for the resources and utilises these in the development of tourism
Raw data	source data/material, which often needs to be converted to a usable format
Database	a tool used to collect and organise information, from which data is transferred to other databases
Interface, API	a definition according to which different programmes to make requests and exchange information between themselves, through which data can be transferred to other databases or to the use of data platforms
Data pool	a large-scale data storage and processing location
Information architecture	an overall model that takes into account the data sources, their collection, storage and standardisation, transfers between different interfaces, the calculations to be performed, as well as the publication for users and the management of user groups

Knowledge-based management tools

Knowledge-based management is expressed in concrete terms as a software solution in which information is presented and shared between different users, generally as a dashboard solution, where the data in question is visualised in information windows. Next, we will describe the requirements of the system to be developed from the perspective of the Helsinki Travel and Tourism Unit.

Requirements of the system architecture

The following figure shows the overall architecture of the software solution for knowledge-based management at a rough level:

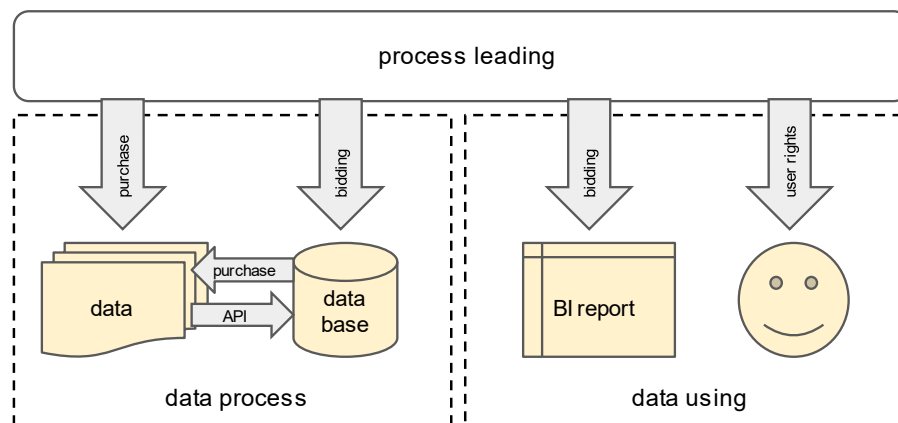


Figure 2. The overall architecture of the knowledge-based management software solution.

The overall architecture is divided into two main phases (data processing and data utilisation), both of which are controlled by the client organisation. Data is obtained in various ways (free of charge, subject to a fee). An information system is required for its storage, processing and visualisation, which must meet the following requirements:

General requirements

Table 2. General requirements for a knowledge-based management software solution.

	Goal	Capability
Extensibility	The system can be developed in stages and its use can be extended in a flexible way so that the parts made do not have to be extensively redone. For example, the coding enables agile	New information sources, information windows and user groups can be added to the system and previous implementations can be modified.

	development and possible dead ends have been avoided.	
Scalability	System performance remains high as usage increases.	System capacity can be flexibly increased (disk space, processor power).
Accessibility	The system meets accessibility requirements.	Technical solutions are in accordance with the requirements of the Regional State Administrative Agency.
Data security and data protection	The system meets the general and the City of Helsinki's data security and data protection requirements.	There is a plan for maintaining the system's data security and the GDPR requirements have been met.
Customer support	The user receives help in case of any problems, and errors observed are corrected quickly.	Customer service and customer feedback processing is professionally organised and supported with the necessary tools.

Information acquisition and integrations

Table 3. Information acquisition and integration requirements for the software solution.

	Goal	Capability
Data sources	Data can be imported from different systems seamlessly.	Understanding of data transfer formats and protocols (logs, JSON, XML, CCV/Excel, PDF, etc.)
Standardisation	Converting data from different data sources to the same format for further processing	Understanding of data structures and data transfer, editing, and downloading (ETL methods)
Interface	Data can be transferred from the system to external systems.	Knowledge of interface solutions, data conversions and search queries

Storage and processing of data

Table 4. Data storage and processing requirements for the software solution.

	Goal	Capability
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Storage	Storage of raw data in the original format	Storage of different data formats and structures for further processing Backups
Database	Logical and efficient database structure for handling large amounts of data	Database know-how, interfaces, search queries and methods, data conversions and modelling
Computing	Refining data for different purposes	Understanding of different algorithms and computing applications

Data visualisation

Table 5. Data visualisation requirements for the software solution.

	Goal	Capability
Information windows	The data is visualised as easy-to-use views where you can drill down deeper into details. On the other hand, combining individual data into larger entities is also a useful feature.	Connecting different data sources to user-driven views, ability to customise views. Drilling down into data has always taken into account examination of the relationship with time. In addition, the data can be viewed by limiting a parameter or several parameters, where this is meaningful. Combining or displaying individual data in the same view selectively may also be a desirable feature.
Prioritising	The data is organised in a meaningful way and the most important information is the easiest to find.	Understanding the basic needs of tourism and the importance of information Ability to customise the user interface
Rights to information	It is possible to define who can see the selected information windows and/or content sets.	Flexible management of user groups and user account access rights

Data flows

The following diagram shows roughly the data flows in the system.

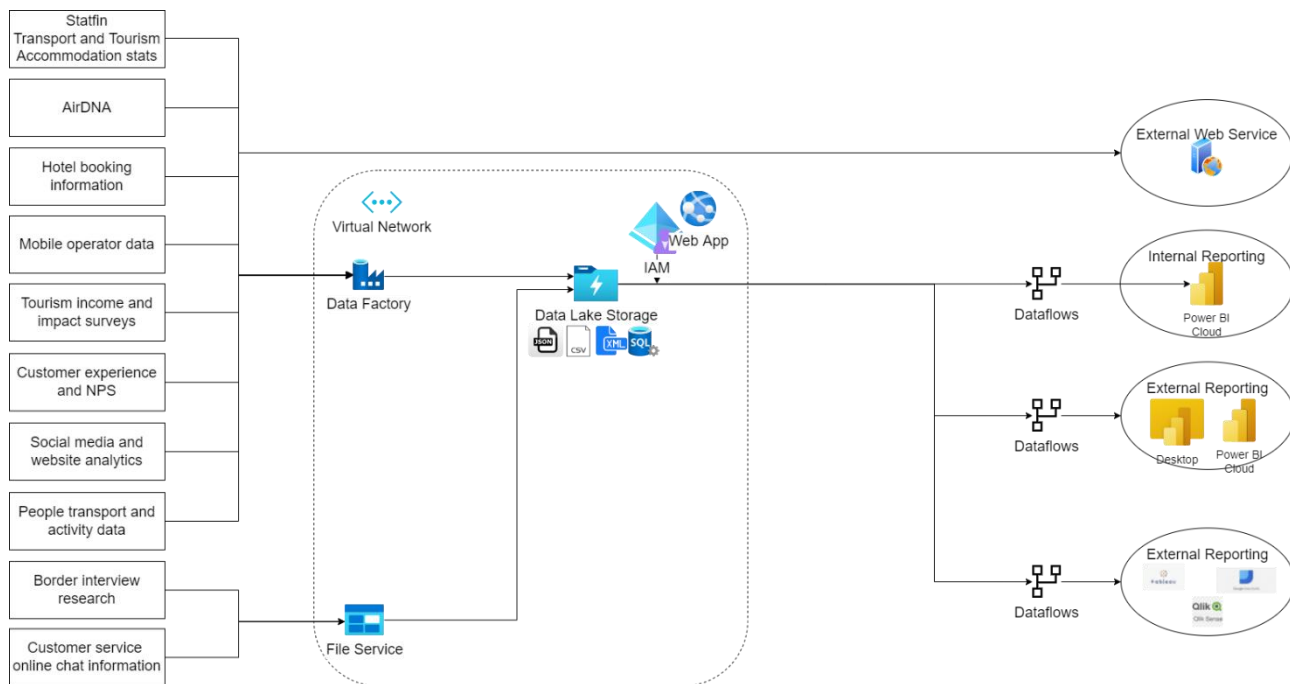


Figure 3. The data flows of the knowledge-based management software solution.

- ☐ The requirement for the system to be developed is to implement the principles of the above diagram in terms of data acquisition, storage, processing and visualisation. The diagram is not absolute for data sources, but only describes different types of data sources. Based on the diagram, the arrangement is not tied to any single technological solution (brand) – what is important is the structure of the overall arrangement.

Functional requirements

The functional requirements describe the user groups of the system and what they can in practice do in the system.

User groups and access rights

Access to the content of the system can be defined on three levels.

Table 6. Access levels for various user groups.

Access level	Administrator	Logged in user	User-specific link	Public
	Named administrator of the system	Each person with access rights has been identified separately.	Easy to distribute to large user volumes	Open to all, for example as part of a public website

User group	Travel and Tourism Unit	Travel and Tourism Unit Helsinki Partners User groups within Helsinki etc.	Member company of the Helsingin tekijät network	Media
Example of content	Manages permissions for other users Users User groups	Results of the marketing campaign Content related to internal use and development only	Summary of STF capabilities Content related to cooperation between companies in the network	Overnight stays in Helsinki Information that is or is intended to be publicly available

From the point of view of Helsinki Travel and Tourism, the most important user groups were identified as:

- Travel and Tourism Unit personnel;
- Helsinki Partners personnel;
- businesses in the area;
- stakeholders in, for example, the media, event industry, 'invest in' operations.

The requirements of these user groups and the listed access levels must be taken into account in the development of the system.

- ☐ It must also be possible to create user groups for individual datasets.

Using and sharing of information

According to the rights assigned to the user and user group, each user who logs in can only view the sections and contents intended for them.

- Navigation between different sections and contents has been made logical and clear.
- The contents of the information windows can be printed and saved in PDF format.

Information needs

The amount of tourism-related information and data sources is endless. Interesting and appealingly presented data may not provide answers to the questions that are relevant in this moment. There may be several sources of information available on important issues, some of which are intersecting, but which provide an individual perspective on the issue

under consideration. In order to get a complete picture, several data sources should be combined, the cost of which may be high compared to the benefits.

With regard to information needs, the following guidelines must therefore be followed in the development of the system:

- We are able to identify a clear need and a question to which the source provides answers.
- We understand the data gaps in the selected data source.

Introduction and utilisation of data sources

The following are questions defined at the rough level for the knowledge-based management framework, to which answers are sought from different data sources:

MARKET	Global tourism ecosystem, how is the market developing, who are the most relevant actors, how do we compare our operations with other actors in Finland and worldwide?				
CUSTOMER EXPERIENCE	CUSTOMER JOURNEY				
	DREAMING PHASE	PLANNING PHASE	PURCHASING PHASE	EXPERIENCE PHASE	SHARING PHASE
	How does our brand reach the potential audience?	How do our services help customers in the purchasing decision?	What services are booked?	How are the services used? What do the customers think?	What do the customers say about their experiences?
IMPACT	Destination level outcomes, use of services and volumes				
REGIONAL ORGANISATION	Management and measures of the regional organisation What measures does the regional organisation take to promote the objectives of attractiveness, sustainability and smartness?				
SERVICES AND SUPPLY	ATTRACTIVENESS		SUSTAINABILITY		SMARTNESS
	What services and products are available to the tourist?		What is the supply meeting sustainable development criteria in the region?		What actions have been taken to develop and disseminate smart solutions?
INFRASTRUCTURE AND OPERATING ENVIRONMENT	What factors of production are available for the needs of tourism?		How will the preconditions for sustainable service development evolve?		Who is committed to the development of smart solutions?

Figure 4. The key questions of knowledge-based management in the destination.

The answers can often be found in many different sources of information, which may contain data in very different formats. For this reason, the introduction and utilisation of data sources must take into account:

- The introduction of data sources can be carried out in stages.
- Visualisation can be a PDF document in the first stage, if it is the original format of the data source.
 - In this case, the information is imported into the information window, but in the original PDF format.
- The data format can be changed in the process if it is considered useful in relation to the costs.
 - For example, a PDF can be converted manually, so that, for example, the number values in the PDF can be included in the new computing measures.
- New data sources can be combined with those already in use in the next stages to create new perspectives.

Knowledge-based management operating model

Use of knowledge-based management tools and methods leads to stronger customer understanding, better decisions and a better understanding of the impacts of both internal and external measures on the ecosystem.

Knowledge-based management requires especially management measures in which the information system to be developed is only a management tool.

Management processes

Important stages in the management process include

- casting,
- utilisation of information,
- development,
- training and continuous learning.

Casting

From the perspective of the development of the tourism industry, it is clear that the overall responsibility for the development of the knowledge-based management system and its processes in Helsinki lies with the Travel and Tourism Unit.

Helsinki Partners will play a significant role in the implementation of the CRM system to be acquired at a later stage in terms of communications and marketing.

- The CRM system will be an important source of information to be taken into account in the further development phases

Utilisation of information

Each unit has its own way of operating and utilising existing information. In general, the ways in which knowledge-based management solutions can be used can be defined in three sets.

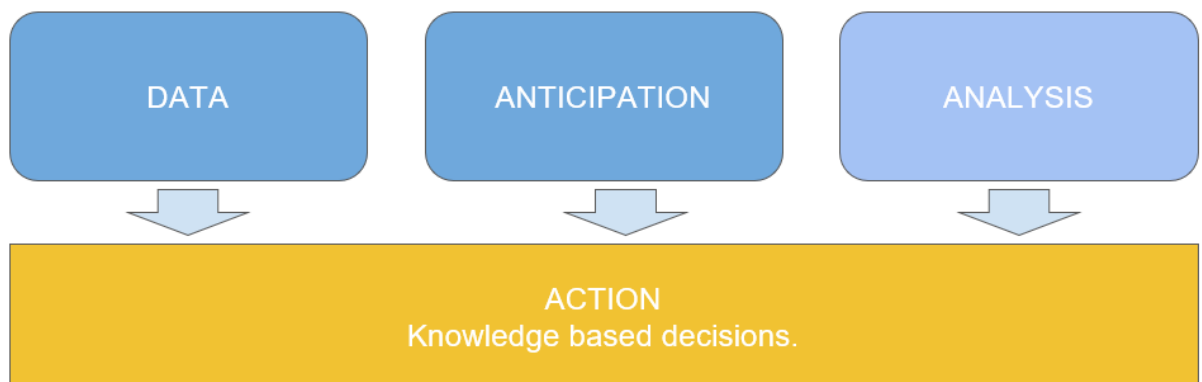


Figure 5. Ways to use information in management.

The **snapshot** is, in practice, a daily process intended in simple terms to answer the question: How are we doing? The overall picture is formed, for example, by determining the sales figures, where customers have come from, the marketing measures we have taken and the customer feedback we have received.

Forecasting is the utilisation of information obtained through the snapshot to plan future measures. The aim is to identify the trends of change, what has changed, what it means and what should be done on that basis.

The **analysis phase** is a deeper way to explore the available data and learn from the results achieved about the effectiveness of the measures, i.e. to gain understanding. Similarly, different forecasting models can be developed for future planning.

The **action** is at the heart of the utilisation of knowledge at each stage. Decisions and guidelines are made on the basis of the resulting understanding, which guides measures.

Development

Knowledge-based management is a continuous process whose operating environment changes constantly. In practice, the project is never completed and the software solution is never perfect.

The organisation must designate a person(s) responsible for the different tasks of the development, and investments in systems, data sources and the services and persons supporting their use must be considered in connection with the annual budgets.

Resources must also be allocated to practical tendering and quality control insofar as new solutions have been introduced.

Training and continuous learning

Knowledge-based management offers endless opportunities for innovation and development. This requires a broad understanding and vision not only of the data being processed, but also of the ecosystem to which the data relates.

The organisation must set aside both time and money to train staff and users. This is particularly important in the first phase of the introduction of the new software solution. The system supplier must be required to have a view on how user training and commitment is to be carried out and how the client will be engaged in the further development of the system, for example in various workshops. The organisation also needs new kinds of expertise for knowledge-based management, such as data scientists who are able to seek answers to the constantly emerging new questions in the available data.

Phases of the development project

The objective of the Helsinki Travel and Tourism Unit is to launch the use of knowledge-based management tools and processes quickly and flexibly. The aim is an iterative process which can quickly create a service that is ready for use, and the experiences gained from it will be utilised in further development.

Based on the above, the development of the system has been divided into four phases:



Figure 6. Phases of the development project.

Tendering phase

The City of Helsinki's Travel and Tourism Unit will seek and tender a partner with which it will start to develop the defined system. At this stage, the selection does not exclude other potential partners at a later stage. The tendering focuses on the end result of the visioned knowledge-based management system and offers opportunities for different, innovative implementation options.

The tendering procedure seeks a supplier for the implementation of the MVP phase and for the implementation of the Version 1 phase.

Tenderers are requested to submit a solution proposal, in which they describe in detail:

- how they will solve the core functionalities of the overall system and verify their functionality by the end of May;
 - what data and content can be included in the implementation of the MVP phase;
- how they will implement further development by the end of the year;
 - what data and content can be included in the second phase of implementation;
- how they will implement cooperation and co-creation with other tourist areas and Visit Finland.

Suppliers will be asked to price their solution proposal

- as a flat-rate project for the year 2022, covering defined development work and software fees;
- possible software and license fees from 2023 onwards;
- an hourly rate for further development from 2023 onwards.

In addition, the tendering procedure must provide descriptions of

- data acquisition;
- data processing process;
- how the system can expand at a later stage;
- management of user groups and access rights;
- data security and compliance with the data protection regulations of the offered package.

First phase of implementation (MVP implementation) includes

- implementer's vision for entities facilitating rapid introduction;
- minimum requirement: introduction of a compliant data platform;
- target schedule: end of June 2022;
- ability to verify that the core functionalities of the overall solution work as desired (user management, data transfer, customisation);
- user testing;
- introductory training and further development workshops.

Second phase of implementation – Version 1 of the overall system includes

- implementation of the most demanding datasets and functionalities on the platform;
- implementer's vision of possible content and functionalities by the end of 2022;
- data analysis and workshops on the system's further development.

Continuous maintenance and development

- This is made part of the process of developing the tourism unit, connecting new information sources, users and user groups, developing new perspectives and applications as small-scale development, if necessary as separate tenders.
- Starts at the beginning of 2023.

Budgeting

During the tendering phase, it is good to identify the scale of the procurement so that the tendering can be carried out correctly. In practice, tendering procures the technical implementation of the arrangement, but the overall equation also includes the cost of obtaining raw data. In principle, Helsinki Travel and Tourism decides on the acquisition of raw data separately, and it is a part of the arrangement that may change every year. Therefore, it is not sensible to take it fully into account in the tendering process.

Rough division of costs for the technical implementation:

- start-up costs EUR 10,000.

- development costs of the first year EUR 20,000–50,000.
- licence costs EUR 20,000–30,000 per year;
- development costs EUR 20,000–30,000 per year.

The amounts are estimated and fully dependent on tendering. However, in comparison with the current technical solutions for tourist information, the above estimates are realistic.

Development costs are the most difficult to predict because they are affected by too many things, especially changes in the needs and development of Helsinki Travel and Tourism.

Naturally, the first year of the introduction of the knowledge-based management system will generate higher costs, but this will clearly be evened out already in the second year. The total cost of the technical implementation of the knowledge-based management system over the first three years will be less than EUR 200,000.

Phases of the development project in terms of information needs and information sources

The aim of the above-mentioned phasing is to implement in the first phase a system on the basis of which a larger entity can be flexibly built. The purpose of the MVP version is to cover the functionalities required for continuous use and development, as well as information sources through which new data suitable for immediately utilisation can be obtained.

In the first development version, completely new information sources or, for example, those that are otherwise in use but have been offered on a separate platform for the time being, are added to the whole.

The prioritisation of data sources described below is based on this objective and serves as a guiding, but not limiting, model for the selection of the technical supplier:

MVP

- Google Trends keywords,
- Myhelsinki.fi website,
- social media channels,
- Tourist Information visitor numbers,
- Bookingpoint website,
- TripAdvisor and Google MyBusiness,
- total number of overnight stays and countries of origin,
- sales and OTA channel data,
- Visit Finland DataHub,
- Ministry of Economic Affairs and Employment statistics.

VERSION 1

- registered overnight stays in Helsinki vs other Nordic capitals,
- marketing ROI,
- event attendees and tourists NPS,
- Tourist Information NPS,
- agreed deals/signed contracts,
- data from unregistered + registered accommodation establishments,
- number of passengers at Helsinki Airport,
- CO2 produced by tourists per km,
- total income from travel,
- amount of time spent on the data platform,
- opinions of the users of the data platform,
- number of STF companies,
- GDS index,
- flight arrivals and departures,
- cruise ferry arrivals and departures,
- measuring the impact of events.

CONTINUOUS DEVELOPMENT

- Global Web Index panel data,
- Meltwater,
- digital marketing channels,
- OTA channels,
- social media listening,
- automation of manual congress counting,
- number of tourism businesses,
- turnover and staff of tourism businesses,
- job vacancies in the tourism sector.

The phasing of the project in terms of data sources is described in more detail in the table below. The data sources of the MVP version have been accurately described and limited to a minimum according to the phase. A strict schedule has been set for the MVP version (May 2022). In Version 1, the data sources and functionalities are expanded as described. In the continuous development phase, data sources are brought in extensively and, after the introduction, progress is made towards the target state, with the related information needs and data sources described in Appendix 1.

Table set 7. Project phasing for prioritisation of metrics. Tables 7.1 to 7.3 describe the three phases of building a knowledge-based management platform. At each stage, the different areas of destination management are prioritised in terms of the realism and usefulness of the implementation. The main elements of the tables are the metrics to be added at different stages, their data sources and the criteria for their inclusion. Particularly in the initial phase, priority must be given to metrics that have good reasons for inclusion in terms of knowledge-based management. However, metrics must be comprehensively included in the various areas of destination management in order to be able to analyse cause and effect relationships.

Table 7.1. Metrics recommended for the MVP version.

DESTINATION MANAGEMENT AREA	KEY QUESTIONS OF DESTINATION DEVELOPMENT	METRICS TO ANSWER THE QUESTION	DATA SOURCES FOR THE METRICS
MARKET	How interesting is Helsinki as a brand in the international market?	Selected Google Trends keywords	CSV data downloadable freely/online feed available
CUSTOMER EXPERIENCE	How to reach and activate potential customers on digital channels? How is the customer path constructed and what feedback do customers give?	Overall visibility in digital channels Commitment to social media communications Bookings in different sales channels Number and rating of customer feedback	Myhelsinki.fi website Social media channels Bookingpoint website TripAdvisor and Google MyBusiness
IMPACT	How many overnight visitors are arriving in Helsinki?	Total number of registered overnight stays and countries of origin	Information is obtained directly from Statfin
MANAGEMENT OF THE REGIONAL ORGANISATION	How are the numbers of Tourist Information visitors developing?	Tourist Information visitor numbers	Excel
SERVICES AND SUPPLY	What tourism services can tourists buy digitally?	The services available on digital distribution channels and their number Number of DataHub companies and products	Sales and OTA channel data Visit Finland DataHub
INFRASTRUCTURE AND OPERATING ENVIRONMENT	What is the company structure of the industry like?	Number of new tourism businesses Number of restaurants	Ministry of Economic Affairs and Employment statistics.

Table 7.2. Recommended metrics for Version 1.

DESTINATION MANAGEMENT AREA	KEY QUESTIONS OF DESTINATION DEVELOPMENT	METRICS TO ANSWER THE QUESTION	DATA SOURCES FOR THE METRICS
MARKET	Helsinki's position in the international market	Registered overnight stays in Helsinki vs other Nordic capitals	Material collected manually on a monthly basis
CUSTOMER EXPERIENCE	Impact and effectiveness of marketing and sales measures?	Marketing ROI Event attendees and tourists NPS Tourist Information NPS Agreed deals/signed contracts	Digital advertising channels CRM system sales funnel data and offline marketing Tourist Information feedback surveys and chat app
IMPACT	How many tourists are staying in commercial accommodation in Helsinki? How many tourists are arriving in Helsinki by air? What is the carbon footprint of travel? What is the tourist revenue for Helsinki? How do events bring in tourist revenue?	Data from unregistered + registered accommodation establishments Number of passengers at Helsinki Airport CO2 produced by tourists per km Total income from travel Income effects of events	Number of unregistered overnight stays added to accommodation statistics Tourism income from a survey directed at tourists, which also provide travel chains, or from a similar statistical examination, total expenditure can be calculated. Studies at events.
MANAGEMENT OF THE REGIONAL ORGANISATION	For what purpose is the knowledge-based management platform used and how much?	Amount of time spent on the platform Opinions of the users	Selected dashboard platform
SERVICES AND SUPPLY	What is the sustainability of tourist businesses in the region?	number of STF companies, GDS index	Visit Finland STF GDS
INFRASTRUCTURE AND OPERATING ENVIRONMENT	How much air traffic does the region receive? How much marine traffic does the region receive?	Flight arrivals and departures Cruise ferry arrivals and departures	Finavia Amadeus, ForwardKeys

Table 7.3. Recommended metrics for the continuous development phase.

DESTINATION	KEY QUESTIONS OF	METRICS TO ANSWER	DATA SOURCES FOR THE
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MANAGEMENT AREA	DESTINATION DEVELOPMENT	THE QUESTION	METRICS
MARKET	Operators and volumes of the global tourism ecosystem, demand by international tourists	Popular channels Travel intentions	Global Web Index panel data
CUSTOMER EXPERIENCE	Optimising marketing and sales measures? What are people saying about Helsinki in the international field?	Marketing conversions ROAS Customer satisfaction, sentiment Monetary value of visibility	Meltwater Digital marketing channels OTA channels
IMPACT	How does tourism affect local residents? How many events and congresses are organised in the region?	Social media discussions (daily) Survey metrics (annual)	Social media listening Automation of manual congress counting
MANAGEMENT OF THE REGIONAL ORGANISATION	How satisfied are the tourism companies and other stakeholders in the region with the activities and services of the Travel and Tourism Unit?	Satisfaction index	Stakeholder surveys (annual)
SERVICES AND SUPPLY	How many tourism companies operate in the region? How big are the companies and how is their business developing? How many people does tourism in the region employ? What kind of talent are we short of?	Number of businesses Turnover and staff of the businesses Job vacancies	
INFRASTRUCTURE AND OPERATING ENVIRONMENT	How many study places are available in the tourism sector?	Number of study places?	

A more detailed list of these information needs, on the basis of which system implementation can be planned, is attached to this document (Appendix 1 – Information needs).

- The listings are indicative and may be subject to changes and additions, because due to organisational changes, the final objectives and their metrics are still under development.

- The aim of the system implementation is therefore to develop a system that meets the stated needs as fully as possible, but does not at this stage bind certain individual systems, service providers or data sources to the final implementation.

Possible solution options

In accordance with the definition project, the table below contains estimates of the tourism industry platforms in use in Finland, which are potential implementers of the solution of the City of Helsinki's Travel and Tourism Unit. All operators have their own strengths and weaknesses in implementing such a project. Different models of cooperation between operators are likely to produce the best result for the solution for knowledge-based management of Helsinki Travel and Tourism.

Table 8. Strengths and weaknesses of potential suppliers of the software solution.

Platform solution	Benchmarking Alliance	Salmi Platform	Visitory	Bizlens	Custom platform solution
Strengths	Own data on hotels, restaurants, and other tourism Tourism know-how	Tourist carbon footprint measurement Availability in real time Travel income May be part of different solutions Tourism know-how	Border interview survey Tourism know-how Comprehensive and well-visualised accommodation statistics Widely used in regional organisations	Tourism know-how Flexible platform: comprehensive user management and customisation capability Readiness to import new data sources to the platform Ready-made integrations with data sources, especially in terms of marketing and Visit Finland Widely used in regional organisations	Anything is possible
Weaknesses	Unable to provide total solution at this time	Platform model not scalable Relatively small in-house resources	Relatively small in-house resources One solution for everyone?	Relatively small in-house resources Not a data source, no data of its own	Everything is expensive No current platform No data Project-led

APPENDIX 1. INFORMATION NEEDS

DATA CONTENT	MARKET
TARGET STATE	Global tourism ecosystem What are the most important players, brands and service platforms? How is the international consumer demand developing and what kinds of customer profiles and segments are forming? What do customers search for and on what basis do they make choices? How do are we doing in the competition as a destination, especially against the other Nordic capitals?
IDENTIFIED DATA SOURCES	Separate tourist surveys Google Trends Global Web Index Benchmarking reports (e.g., European Cities Marketing, UNWTO, WEF Travel & Tourism Competitiveness Index)
METRICS	Ranking in Nordic comparison

DATA CONTENT	CUSTOMER EXPERIENCE/DREAMING PHASE
TARGET STATE	Understanding how the Helsinki brand reaches customers in various channels and how marketing measures affect the market. Overall view from the point of view of both digital and traditional channels
IDENTIFIED DATA SOURCES	Digital marketing channels (Google ads, Facebook Ads, etc.) Brand research Social media channels Media research on the effectiveness of advertising Google Trends
METRICS	Views on social media channels Overall visibility in digital channels Commitment (likes, shares, comments) Link clicks Most popular keywords Social media discussions Top-of-mind awareness

DATA CONTENT	CUSTOMER EXPERIENCE/PURCHASE PHASE
TARGET STATE	What services customers buy and book, how far ahead bookings are made and how this changes in a different time period, the impact of seasons and other external factors on the willingness to book. Which booking channels are most popular?
IDENTIFIED DATA SOURCES	Travel booking systems, such as Bokun, Johku, Winres, Hotellinx, Sportum, etc. OTA channels, e.g. Booking.com, Expedia, Viator, Airbnb, Bookingpoint Amadeus, ForwardKeys, airline reservation systems Cruise companies' booking systems
METRICS	Accommodation bookings Activity reservations Flight bookings Cruise bookings

DATA CONTENT	CUSTOMER EXPERIENCE/PLANNING PHASE
TARGET STATE	Understanding how the digital channels maintained by Helsinki meet customers' needs in travel planning and service selection. Can we guide the customer to the desired customer journey, what content and measures work best, which services interest them the most, where is the customer journey broken and how could this be developed/repared?
IDENTIFIED DATA SOURCES	Website analytics (Google Analytics, Matomo, etc.) Social media channel analytics Application data (potential) Destination searches on other services (such as Finnair/OTA channels/Airbnb)
METRICS	Website visitors by segment Most popular pages Time spent on pages Call To Action and achievement of objectives Exit pages

DATA CONTENT	CUSTOMER EXPERIENCE/EXPERIENCE PHASE
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TARGET STATE	What tourists do in Helsinki and how well our offerings serve them. Where do they stay, visit and shop? What kind of customer experience do we produce in different services? How many come back?
IDENTIFIED DATA SOURCES	visitory.io Benchmarking Alliance Statistics Finland Salmi Platform AirDna/Transparent Customer satisfaction surveys Tourist Information TravelAppeal
METRICS	Registered overnight stays Number of customer feedback NPS Tourist Information contact numbers

DATA CONTENT	CUSTOMER EXPERIENCE/SHARING PHASE
TARGET STATE	What tourists who have visited Helsinki tell other about their experiences, what is said about Helsinki in the media
IDENTIFIED DATA SOURCES	TripAdvisor Google MyBusiness Meltwater Social media channels My Reputation Monitor
METRICS	Number of reviews Rating of reviews Number of media and social media hits Sentiment of media and social media hits

DATA CONTENT	IMPACT
TARGET STATE	In concrete terms, we understand the impact of tourism on Helsinki, both for the economy and for residents. We can assess the impact of the measures taken on the success of local tourism enterprises and on the development of employment. We are able to optimise development

	measures from the point of view of, for example, responsibility, resident satisfaction or traffic flow.
IDENTIFIED DATA SOURCES	Border interviews Tourist income surveys Carbon footprint counters Measurement of the carbon footprint of movements Statistics Finland employment statistics Studies and surveys for the business field Surveys in Helsinki directly to tourists Cell phone data Hypercell Salmi Platform
METRICS	Travel income Employment Tourist flows and dwell time Motives of tourists Carbon footprint of tourist movements Biodiversity and nature conservation Resident satisfaction NPS

DATA CONTENT	MANAGEMENT OF THE REGIONAL ORGANISATION
TARGET STATE	We understand how the measures of the regional organisation affect the development of tourism business. How the main stakeholders perceive the measures taken and their results.
IDENTIFIED DATA SOURCES	Steering system of the Travel and Tourism Unit CRM of the Travel and Tourism Unit (to be acquired in spring 2022) Feedback surveys for stakeholders (Helsingin tekijät, etc.) Municipal and tourism strategy
METRICS	Number of measures Stakeholder satisfaction

DATA CONTENT	SERVICES AND SUPPLY/ATTRACTION
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TARGET STATE	To understand how the Helsinki region's services and other offerings develop the region's attractiveness as a tourist destination. What service offerings exist and how they can be purchased. How many and what type of activities are carried out, how successful they are in achieving the objective and how resources should be allocated based on this information.
IDENTIFIED DATA SOURCES	Visit Finland DataHub Bookingpoint.fi Vainu.io Statistics Finland Service map (accessibility) Websites and their links
METRICS	Number of companies and products in DataHub Number of companies and products in Bookingpoint Number of congresses, number of attendees Number of events, number of attendees

DATA CONTENT	SERVICES AND SUPPLY/SUSTAINABILITY
TARGET STATE	Understanding what measures will be taken to achieve the sustainability objective in line with the strategy and how it will affect the region's service offering and tourist choices.
IDENTIFIED DATA SOURCES	Visit Finland STF program Global Destination Sustainability Movement
METRICS	Number of STF certificates Number of companies on the STF path GDS index

DATA CONTENT	SERVICES AND SUPPLY/SMARTNESS
TARGET STATE	Understanding what measures will be taken to achieve the smartness objective in line with the strategy and how it will affect the region's capabilities and activities.

IDENTIFIED DATA SOURCES	Visit Finland Academy queries Travel and Tourism Unit internal reports (Excel)
METRICS	Digital readiness of enterprises (ready, steady, go) Internationalisation capacity of enterprises (Ready, Steady, Go) Number of cooperation projects with educational institutes Implementation of initiatives (Advisory board, tourism network, lobbying)

DATA CONTENT	INFRASTRUCTURE AND OPERATING ENVIRONMENT/ATTRACTION
TARGET STATE	An overview of the factors of production and infrastructure in Helsinki based on which the region's attractiveness will be developed. What kind of investments and projects are coming and what should be prepared. City planning, traffic and other factors related to the everyday life of residents and tourists.
IDENTIFIED DATA SOURCES	Statistics Finland Mara City of Helsinki, Public Works Department
METRICS	Number of new tourism companies Number of restaurants Investments in service construction Number of flight arrivals, passenger numbers Number of cruise ferry arrivals, passenger numbers

DATA CONTENT	INFRASTRUCTURE AND OPERATING ENVIRONMENT/SUSTAINABILITY
TARGET STATE	An overview of the factors of production and infrastructure in Helsinki, which must be taken into account when planning measures for the sustainability targets and how these will develop as a result of the measures.
IDENTIFIED DATA SOURCES	Emission calculations Statistics Finland City of Helsinki, Public Works Department
METRICS	Evolution of emissions

	Study places
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DATA CONTENT	INFRASTRUCTURE AND OPERATING ENVIRONMENT/SMARTNESS
TARGET STATE	An overview of how to mobilise different stakeholders for the development of a common goal, a smart destination. How many different actors commit to the objective, what measures they take and what capacity this creates for the tourism industry.
IDENTIFIED DATA SOURCES	Travel and Tourism Unit internal reports (Excel)
METRICS	Number of members of Helsingin tekijät Number of participants in different projects

DATA CONTENT	DEVELOPMENT OF THE RESTAURANT ECOSYSTEM
TARGET STATE	Providing relevant information to restaurants and making it easily accessible (e.g. event information, major street works, tourism-related information, facility and area rentals)
IDENTIFIED DATA SOURCES	Event data, road works and special traffic arrangements, data describing the tourism phenomenon
METRICS	New restaurants in Helsinki Product information Visit Finland DataHub Restaurant activities in new environments (e.g., ice skating rinks, ski trails and museums).