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Towards Artificial Intelligence by Knowledge and Capability to Lead Rural Development Processes

Finnish Food Authority, Rural Areas Division and the Development Subsidy

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ABSTRACT:

Government policies can promote support and activities for rural areas and innovative technology. AI Act game into force 1st of August 2024 by European Union. Finnish Food Authority (FFA) in Finland has one unique status and function because it has Rural Areas Division (Paying Agency) which has started when 1st of January 2007. The main responsibility for agency was implementation of agricultural policy in Finland by digitalizing e-services for agricultural and rural development support and further agricultural policy period and CAP (Common Agricultural Policy). Since beginning of 2019 merged Finnish Food Authority (FFA) started, and authority use the name Ruokavirasto in Finnish. Now Rural Areas Division is taking care of implementation of agricultural and rural development subsidies and funds more than 2 billion euros of European Union and national subsidies annually.

The objective of this study is impacts of artificial intelligence (AI) in public sector case study organization and to analyses new CAP-strategy 2023-2027 and Rural Areas Division implementation processes. Aim is to provide present information about FFA artificial intelligence (AI) situation and expectations in organization based on strategies and regulations. Further on, narrowed focus is to study technical assistance as one subsidy type in Hyrrä-online webservice software development by DevOps process for regional customers. This qualitative case study focused on FFA AI network data, literature reviews and on collecting AI efforts by theme interviews. Research theory is based on understanding AI, public sector services, processes and AI capability, knowledge, lean management and continuous improvement to enhance and develop case organization future AI management, vision steps and build AI capability by utilization models.

Results show that we need to go towards generative AI step-by-step and start with AI strategy goals, AI knowledge and capability creations, data quality and proper education. In addition to this, we can develop different levels of customer-friendly web services by continuous improvement (CI) and grow individual and team AI learning skills and open discussion.

It is important to reach impacts of AI with chosen suitable AI tools for customers, recognize AI risks, ethics and AI possibilities in public sector as well as recognition and guides with common administrative processes, quality data. Active AI networks besides research, common development projects, pilots, impacts of subsidies and innovations could be future research themes.

KEYWORDS: The Finnish Food Authority and strategy, Rural Areas, CAP-strategy, Artificial intelligence, Knowledge, Capability, Hyrrä-online webservice and Continuous improvement

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TIIVISTELMÄ:

Hallituspolitiikat voivat edistää ja luvata tukea maaseudun kehittämiselle ja innovatiivisille teknologioille. Euroopan Unionin tekoälyasetus astui voimaan 1.8.2024. Suomesta löytyy ainutlaatuinen virasto, jonka asema ja toiminnot Suomen ainoana maksajavirastona aloitettiin 1.1.2007 Maaseutuvirastona. Viraston vastuulla on muun muassa maataloustukien ja maaseudun kehittämistukien ja kehittämisohjelmien ja CAP-strategian toimeenpanon digitalisaatio ja sähköisten asiointipalveluiden tuottaminen asiakkaille. Vuoden 2019 alusta Maaseutuvirasto fuusioitui Ruokavirastoksi, jonka yhteydessä jatkaa maaseutulinja. Maaseutulinja toimii edelleen Suomen maksajavirastona, huolehtien maatalous-, markkina- ja maaseudun kehittämisen tukien toimeenpanosta ja yli kahden miljardin euron vuotuisten EU- ja kansallisten tukimaksujen maksujen maksamisesta.

Tämän tutkimuksen tavoitteena on analysoida uuden CAP-strategian ja maaseutulinjan toimeenpanon tukiprosesseja sekä tarjota tietoa viraston tekoälyn käytöstä, osaamisesta, kyvykkyydestä sekä odotuksista julkisella sektorilla. Tutkimuksessa keskitytään erityisesti yhden tukimuodon: teknisen avun Hyrrä-verkkopalvelun toimeenpanon ja tekoälyverkoston prosessiin.

Tutkimustietoa kerätään tekoälyponnisteluista teemahaastatteluin. Laadullinen tapaustutkimus etsii vastauksia tutkimuskysymyksiin teemahaastettaluiden, käsitteiden ja kirjallisuuskatsauksien avulla. Asiasanoina tutkimuksen keskiössä olevat kyvykkyys, tietämys, leanaus ja jatkuva parantaminen. Ne kuvaavat kehitysaskeleita Ruokaviraston tekoälyvision ja kyvykkyyden rakentamiseen sekä tulevaisuuden tekoälyn hyödyntämiseen liittyvien mallien luomiseen. Taustalla vaikuttavat organisaation rakenne, strategia, ydinprosessit, vahvuudet, mahdollisuudet, esteet, tiedot, taidot tai koulutus käyttää generatiivista tekoälyä.

Tutkimustulokset osoittavat, että kohti generatiivisen tekoälyn käyttöä on hyvä edetä vaiheittain. Tekoälystrategian tavoitteiden kautta voi luoda tekoälytietämystä ja saavuttaa kyvykkyyksiä, kun panostetaan tiedon laatuun sekä sopivaan koulutukseen. Lisäksi voimme luoda eri tasoisia asiakasystävällisiä verkkopalveluita jatkuvan parantamisen avulla, lisätä yksilöiden ja ryhmien tekoälyn osaamistaitoja sekä avointa keskustelua.

Tärkeää on luoda asiakkaille vaikuttavuutta sopivien tekoälyvälineiden turvin. On tunnistettava tekoälyyn liittyviä riskejä, etiikkaa ja tekoälymahdollisuuksia julkisella sektorilla. Yhteiset hallinnolliset prosessit, laadukas data, tekoälyverkostot, ohjeistukset, yhteiset kehittämisprosessit ja aktiivinen tutkimus- ja innovaatiotoiminta, projektit, pilotit ja tukien vaikuttavuus ovat tärkeitä tulevaisuuden tekoälyn tutkimusteemoja.

Avainsanat: Ruokavirasto ja strategia, maaseutulinja, CAP-strategia, tekoäly, tieto, kyvykkyys, Hyrrä-verkkopalvelu ja jatkuva parantaminen

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Abbreviations

AI = Artificial Intelligence
CAP = Common Agricultural Policy
DPO = Data Protection Officer
EAFRD = European Agricultural Fund for Rural Development
EDC = Economic Development Centre
FFA = Finnish Food Authority
NRP = National and Regional Action Plan
PINJA = Education Platform of Finnish Paying Agency
PRIKKA = Finnish Food Authority intranet work page
RURAL AREAS = Rural Areas Division

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1 Introduction

The history of artificial intelligence (AI) goes back to the year 1950. Since then, the first computers were assembled. Machine learning means that large data sources are in AI use and AI models are trained models for us (Lamb, H., Levy, J. and Quigley, C. 2024, 7).

According to Niemi, J. & Ahlstedt, J. (2005) due to natural conditions in Finland we have succeeded production on common EU market and developing the CAP (Common Agricultural Policy) in such themes which have noticed the needs in Finland. Climate change forces us to think of new challenges in Finnish agricultural and rural policy and actions. Industrialized countries should be able to reduce emissions from the current level 50-60% by 2050. It seems that there is more pressure for change in environmental policy because consumers also are increasingly aware of environmental and financing issues.

Recently The Agriculture and Fisheries Council was discussing the viability of rural areas and other issues concerning agricultural things and questions. According to European official website The European Union and Common Agricultural Policy (CAP) have main policies guiding and directing policies in agriculture and **the rural areas** in Finland too. Policies enabling a secure and affordable European food supply, providing support to income and resilience of the farming sector. In addition to this, fostering the transition to environmental and climate sustainability as well as **developing and promoting dynamic rural areas** and finally providing support for the complement by national funding.

It is obvious, that viability in rural areas in Mainland Finland need targeting resources and capability to use these available CAP subsidies effectively in cooperation with many expects but also capability to implement grant funding by The Finnish Food Authority (FFA) and ability to notice recent and future strategic choices, challenges and impacts in The Finnish Paying Agency for digital data-based value and customer-friendly functions.

According to The Ministry of Finance public sector can use Generative AI guidance to support and encourage using AI in Finnish administrative work and organizations. Guidelines were launched last year on 20th of March 2025.

For our FFA own administration of artificial intelligence things, conversations with other AI-teams and enthusiastic AI-innovators, spreading AI materials, it was necessary to open FFA intranet workspace for AI-driven discussion common use. This active workspace (in intranet) is called: Artificial Intelligence Network and in Finnish "*tekoälyverkosto"* (Prikka-intranet).

Artificial intelligence network members have studied guidelines for the use of creative artificial intelligence. Members have read the European Commission´s proposal for artificial intelligence regulation and have held AI-workshop in June 2023. For the workshop everyone prepared advanced tasks related to AI-topics. June 13th, 2024, came into force harmonized AI rules (EU 2024/1689) by European Parliament and of the Council.

1.1 Research background

Finnish Food Authority (FFA) operates under the Ministry of Agriculture and Forestry in Finland. Authority´s activities are covering Finland entirely. At present moment, when we have a closer look at our organization strategy, it indicates two specific targets and objectives:

- *Strong, domestic food production and rural regions. We support sustainable food production and rural vitality → Data interoperability*
- *Our data serves for our customer and the whole food system in Finland.*

These targets can be seen as a research phenomenon and through problem. As a phenomenon, we are studying where can we use artificial intelligence with continuous improvement integration toward strategical targets in the Finnish Food Authority and Rural Areas with a subsidy and support process. As a problem, we are finding out what our

organization’s present situation is related to knowledge and capability of the use of artificial intelligence.

This thesis is the first artificial intelligence (AI) university level study research in FFA and Rural Areas. In our organizational structure, knowledge, and capability with use of AI is a key role when we can use artificial intelligence in our daily substance work tasks too.

World is changing rapidly towards AI in our organization and field to work with too. Recently, I as a researcher did also artificial intelligence (AI) related coordinator tasks and established an internal network and a chat channel for members for artificial intelligence group of enthusiastic colleagues in Ruokavirasto. Russell and Norvig (2014, 1) determine artificial intelligence as a clear builder of intelligent entities and owner of two main dimensions: behavior and on top of that processes and reasoning. AI could give us “right” answers when it knows what it rationally should measure. It is naturally true, that AI could go further than our human being’s own intelligence can go.

Continuation of the previous reasons of study this subject further is, that as a main task in management coordination researcher is taking care of one specific CAP support type for area administration in Finland. This support will be funded from the resources of European union and state finance for customers like fifteen ELY Centre’s (The Centre’s for Economic Development, Transport, and the Environment) in the central government level in Finland (since 1st of January 2026 Economic Development Centre’s, EDC´s) and this support can be used during years 2023-2027.

According to official website of European Union, CAP means Common Agricultural Policy which includes plans for each EU member country for implementing their tailored agricultural and rural development plans during longer periods like 2023-2027.

Firstly, this case research will be targeted on whole rural development program and it´s support types with their budget during Common Strategy Policy, abbreviated CAP-

strategy during 2023-2027. This research focuses on CAP-strategy during 2023-2025, which is the first 3-year period before CAP comes to middle of CAP-budget period in Finnish rural development subsidies implementation (Document L:2021:435: TOC. Official Journal of the European Union, L 435, 6 December 2021).

Also, one longer timeline with customers is coming to an end and chance has effects to implementing also rural development implementation processes. Alongside fifteen ELY Centre's will be history in Finland 31st of December 2025 because ten new Vitality Centre's. These new Vitality Centre´s will be operating partly under the Ministry of Employment and the Economy's administrative branch will start 1st of January 2026. It is worth to mention, that these Vitality Centre's operate in a customer-oriented manner by using digitalization and in cooperation with other public sector actors. These digitalization tools for ELY Centre's and new vitality Centre's are provided mostly by Ruokavirasto.

Today particularly in client interface, we realize the need to start developing new tools for all our main processes and functions related to artificial intelligence. In addition to this, **it is necessary to find ways towards utilizing artificial intelligence in the future towards service-oriented and modern technological administration. First, we need to clear up what kind of capability situation we have now for use of artificial intelligence, and which are next steps to reach more knowledge and capability to need direction**.

Secondly, in this research is attended **to examine Finnish Food Authority and it´s steps and enhances of artificial intelligence (AI) development use and specially exploitation of AI for technical assistance modern digital process in future years.** In this context it is worth mentioning that each country belonging to European Union has technical assistance as a one type of CAP administrative support type for implementation this CAP-strategy in their member states.

It is also inevitable and a key for future that we need more information and skills to use new artificial intelligence commissioning to implement the European Union financial

CAP-instruments. Fact is also that we have lot of information already about AI usable and we need to learn how to use it, for instance cost-effectively, sensitively and customer friendly. Our processes of implementation and online webservices must be attainable 24/7 and reliable. Next figure 1 shows FFA organization's main structure.

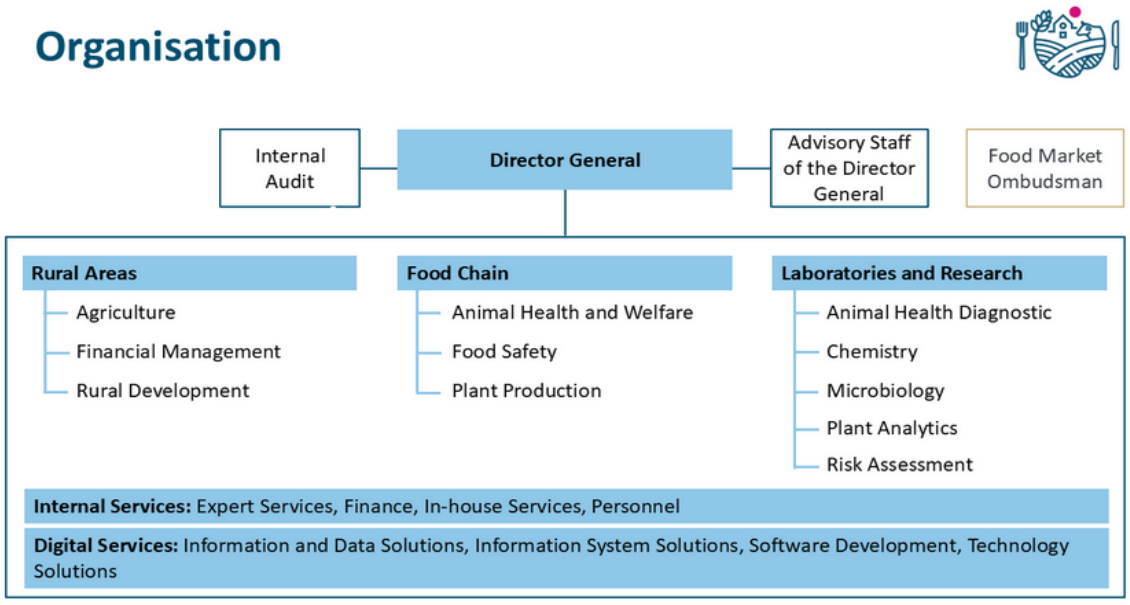

Figure 1. Finnish Food Authority, Rural Areas and Rural Development as one department.

Aim of the CAP Strategical Plan was to support a smart, competitive, resilience and diversified agricultural sector to ensure long-term food security. For example, CAP-instrument gives support to many sectors and Member States approximately 23% of farm income in 2020. Same kind of guidelines are written in Report (celex:52023DC0707) from the Commission to the European Parliament and the Council.

Compressed can sum up, that to be able to understand and concern customer needs, it is important and necessity to brighten our own organization processes and capability to do tasks in modern new ways like openly documented continuous improvement and with new tools like AI. **This research has written along researcher's daily implementation work in public sector by studying constantly more about AI knowledge and capability from different available national and internationals public sector sources.**

1.2 Aim of the research

Topical research questions in public sectors, services and government are concerning development of FFA knowledge and capability by continuous improvement with AI and impacts of AI can be presented through the following questions:

1. **What steps need to be taken in Finnish Food Authority to be able to use and exploit artificial intelligence (AI) in Rural Areas (Division) in future years?**
2. **How do use of AI enhances the development towards service-oriented and modern technological administration in technical assistance process?**
3. **What kind of capabilities and knowledge are needed to use AI now and in the future?**

This research focuses on AI in Rural Areas. This chosen limitation exists because target of this study is to find out general description of our strategic AI phenomenon but also deeper situation in our own Rural Areas AI situation. Due to that focus we can also easily develop our processes, educate work teams to gain better results and find out more about useful AI tools for our functions and goals today and in the future.

In my opinion, it is essential to recognize the best AI practices towards organization AI knowledge, capability, and continuous improvement process to implement our updated organization strategy, and CAP-strategy by using literature reviews, theme interviews, answers to those research questions, collect AI network discussions and AI user needs.

As a first step in Finnish Food Authority AI-pilot was made with Hyrrä-online webservice data. Hyrrä-online works in Finnish and in Swedish in it is operated by customers from mainland Finland and from Åland. Process consists of activities and usually processes include functions from different parts of organization like resources. One process can pass several functions like processing of applications. Processes should act fast, flexibly and effectively so it doesn´t take a lot of resources nor take much time.

This research study questions, researcher´s gained data were classified as amount of technical assistance and artificial intelligence network members, ideas of AI and needs from AI intranet page and specific AI theme interviews.

Finnish Food Authority is playing an important role as a European paying agency too. The Authority takes care of, for instance, farming subsidies, different projects, and structure subsidies. Rural Development Department consists of five different units and most of rural development support is implemented by Development Support Unit. As an exception: Technical assistance as administrative support type is implemented in Rural Areas and in Rural Development Department.

Target is, that our data could always serve our customers and partners. Also, we need to exploit open government thinking and principles of public authority in Finland. Aim of this thesis is to find out Finnish Food Authority (FFA) AI tendencies and pursuit, motives and needs as a phenomenon which can create a general AI-model for our customer implementation services and processes with continuing improvement. These research questions have repeatability features. This study answers tries to answer the questions related to how AI can be used (Metsämuuronen, J. 2001, 13).

Closer targets in our organization new strategy (started 2025) are result of the workshops in 2024 (Ruokavirasto 8.7.2024). Artificial intelligence is one of our future tools and our strategical target is to use our data so that we have better knowledge and capability to serve our customers and fill official requirements in FFA Rural Areas at the best and implement different subsidies through our processes. The objective is also to provide proper online web-services in an effective way via continuous improvement and artificial intelligence where AI use is suitable and ethical.

Next presenting closer (Figure 2.) how Rural Areas (Division) has comprehended, and which part Rural Development Department is located where technical assistance has implemented and technical assistance online webservice process has owned. Hyrrä-online

webservice is belonging by the same Rural Development Department but operated in IT Unit for Development Support.

Rural Areas Division (rural areas)
Agriculture Department (agriculture)
Farmer Payments Unit
Farmer Payments Control Unit
IT Unit for Farmer Payments
Rural Development Department (rural development)
Development Support Unit
Food Market Unit
Inspection Unit
IT Unit for Development Support
Rural Network Unit
Financial Management Department (financial management)
Accounting Unit for Support /Support Accounting Unit
Forest and Market Support Unit
Payments and Recoveries Unit

Figure 2. Rural Areas Division organization since 1st of January 2026.

Technical assistance is a CAP-strategy subsidy type which implementation process starts when technical assistance funds are shared by letter of distribution fund of Ministry of Land and Forestry. These funds are recorded into Hyrrä-online web-service for implementation use of Finnish rural area support systems in Finland. This rural area is whole Finland and funding period last 2023-2027. Before that there are some European Union level stages to proceed in funding process. The European Commission has accepted Common Strategic Policy (CAP) from Finland 31st of August 2022.

According to the CAP public payments of total 100% funding amount to Finland from European Rural Development Fund is paid 2,5% share as technical assistance. That amount of subsidy has intended to use by actors of technical assistance ELY Centre's mostly. Mainland Finland has about fifty-five million euros share for ELY Centre's and about 823 000 euros in Åland. Above-mentioned amount of euros is in the case that CAP strategy subsidies have succeeded, realized, and paid in full.

There are ten main services of the Finnish Food Authority and one of these is Hyrrä-online webservice for development supports. Before there are our leading functions The Finnish Food Authority has three tasks like effectiveness in society, productivity in functions and possession of resources. Also, strategy and vision are in same line with our tasks. See description 1 how focus on this research is processes of Rural Development (Department)is in digital dimension. According to Karjalainen (2006), knowing better our own processes, helps organization recognize reasons which usually cause problems. After understanding problems, organization is ready to see meanings of its functions and even services (see below figure 3). Researcher opens more about results in next chapter four.

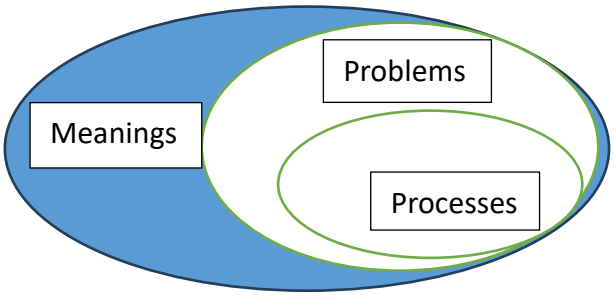

Figure 3. Relationship of processes, problems and meanings in organization. Karjalainen (2006).

This study focuses on cases, the one rural development support type of implementation which is **technical assistance**. Thus, limitations of research timing and research study target are set clear in purpose. This study examines also Hyrrä-online webservice as a process for technical assistance subsidy. See closer Prikka intranet (2025) process steps and translated figure 4.

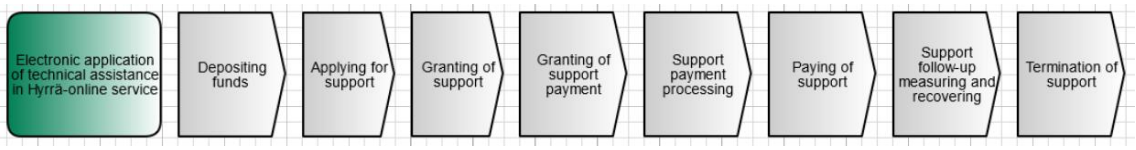

Figure 4. Hyrrä-online webservice steps in technical assistance process.

This CAP-strategy support type: technical assistance is called in Finnish “tekninen apu”. Technical assistance nationally is regulated in law 1376/2022, Management law of CAP-strategy is regulated 1324/2022 and Rural Development supporting in law 1325/2022

Nationally technical assistance is implemented as an administrative subsidy type 100 percent in Hyrrä-online webservice in Finland.

Main customers and main partners of technical assistance were fifteen ELY Centre's by the end of year 2025. ELY Centre's represented the administrative organizations under the Ministry of Economic Affairs and Employment. In addition to the Ministry of Economic Affairs and Employment in Finland Finnish Food Authority grant partly European Union funding as technical assistance to the ELY Centre's which took care of rural areas supports and subsidies regional implementation and rural development tasks.

In general, European Agricultural Fund for Rural Development was granted as support by ELY Centre's and European Fisheries Fund too. According to Finland´s National Reform Programme 2024 by (Ministry of Finance) Finnish Government of regional state administration start at the beginning of 2026, when ELY Centre's changed their administrative functions to ten Economic Development Centre's (EDC´s).

This study examines FFA and Rural Areas and Rural Development Department as administrator and implementor of technical assistance subsidy and by centralized management to ELY Centre's and Economic Development Centre´s in years 2023-2026 (Q1). This limitation of research study timing is essential due to FFA´s customers and partners in those Centre's.

As mentioned before, since 1st of January 2026 ELY Centre's were history because the new regional Economic Development Centre's (see figure 5.) started their vitality functions in Finland as Rural Areas (Division), Rural Development main customers and close authoritative co-partners in the following called names and areas:

Economic Development Centre of Uusimaa
Economic Development Centre of Southwest Finland
Economic Development Centre of Southeast Finland
Economic Development Centre of Inland Finland
Economic Development Centre of Central Finland
Economic Development Centre of Eastern Finland
Economic Development Centre of South Ostrobothnia
Economic Development Centre of Ostrobothnia
Economic Development Centre of Northern Finland
Economic Development Centre of Lapland

Figure 5. Ten Finnish Economic Development Centre´s (EDC´s)

All those CAP Strategy 2023-2027 development support types have implemented by Hyrrä-online webservice system, and these support types will be implemented by the Rural Development (Department) in the Finnish Food Authority in Finland. In Finland technical assistance fund consist of 43% EU-money part and 57% of national money.

Behind this case research there has data based on environment and strategies of FFA which paid 2,13 billion euros to rural development and agriculture in Finland in 2023. And in 2024 1,9 billion were paid to agriculture, rural development and market subsidies The same organization conducted over 419 000 laboratory research (351 268 in 2024) and published 51 scientifically peer-reviewed publications in 2023 and 45 publications in 2024.

Based on FFA net page (www.ruokavirasto.fi) organization is committed “to protecting the privacy and personal data of data subjects.” It is noticed, that in Rural Funding in past 8 resent years 2014-2021, The Finnish Paying Agency, there are over 6600 enterprises which have got funding and over 7000 projects and 11 000 new jobs. During 2014-2022 there has been 350 million euros fund for rural area firms and one billion euros private money.

According to FFA, Rural Areas has calculated that 14 000 farming supports and 6300 kilometers broadband projects (2014-2022) have been implemented. 100-150 bioenergy

plants and thermal centers are financed yearly, and two thousand new farmers got starting support (2014-2021). In addition to that, 23 200 farms ordered advice on their farming activities and about 83% of farms committed environment- and water conservation activities. In ten recent years use of phosphorus fertilization has halved and 70% of farmers keep fields vegetation covered over wintertime. In addition to this, 5700 farms promote welfare for animals (2014-2021). The total amount of farms which applied for farmer subsidy in 2021 were 46 800 farms and even 95% of the farms applied electronically for the subsidies and 100% technical assistance subsidy in 2021.

In this study research there are existing papers of literature review and different strategies which have legally required tasks and mandatory tasks for public sector, some policies and specially visions for Finnish Food Authority in this research study context and subject. AI-network channels where employees are involved are important. This qualitative case research study consists of several kinds of methods. Research data has collected many sources but by theme interviews, one individual interview, organization intranet and educational material and by internal network of AI which means for research study organization generative artificial intelligence providing learning from our mass data resources and new contents.

Related to this research, researcher has as work tasks in FFA, Rural Development Department mostly nationwide rural development support administration, implementation, process coordination, different level continuous development team projects and Hyrräonline webservice application definition, planning, testing, education, instructions written and all kinds of developmental tasks in different teams and artificial network (AI).

In FFA, Rural Areas implements into customers rural development funds by EAFRD. These statutory funds and supports have covered by European and Finnish budget. Strategy emphasized, that personnel work together seeking solutions and is capable. In addition to this, we should have competent for renewals and knowledge consider

customers and partners in whole food system by responsible operations (Figure 6. Finnish Food Authority Strategy and Vision 2030).

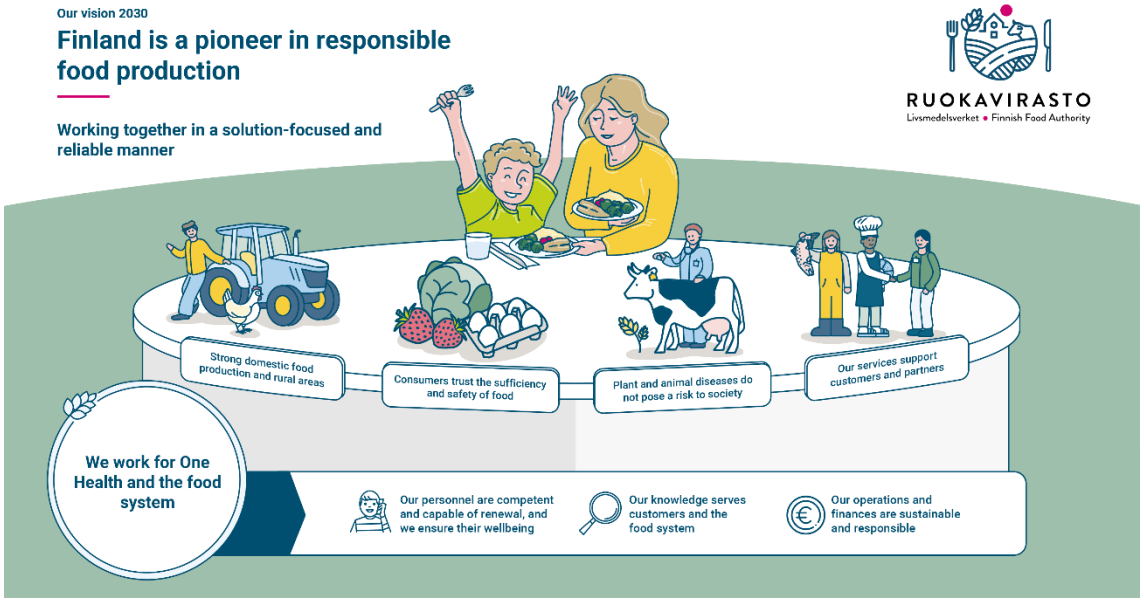

Figure 6. Finnish Food Authority Strategy and Vision 2030.

In FFA strategy is written, that "*We work for One Health and the food system*" in FFA, but further on "*strong domestic food production and rural areas*" are a key strategy to this research study. FFA values say, "working together in solution-focused and reliable manner" and our vision 2023: "Finland is a pioneer in responsible food production". In this point, it is good to notice that strategies and these visions and values are suitable also, when we examine AI knowledge and capability to lead Rural Areas processes. "**Our personnel are competent and capable**" and "**our knowledge serves customers** and food system" are very important research targets in this research study.

Rural Areas customers can be either rural small and medium-sized companies or rural action groups. In Finland are 5 653 269 inhabitants in November 2025 and farms 40 968 in 2024. Further on according to Statistics Finland small and medium-sized companies have 50 employees at least and medium-sized companies have over 250 employees. On the other hand, customers and partners can be from associations from rural area, like The Centre's for Economic Development, Transport and the Environment (ELY Centre's)

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which were taking care of regional implementation tasks of the central, regional government level in Finland and The Government of Åland too.

1.3 Structure of the research

There are five chapters in this research. Abstracts in Finnish and English are in pages 2-3. First chapter outlines an introduction part into whole research framework in a specific field of public sector organization. There is context of research approaches like FFA, Rural Areas as an organization and used CAP-strategies in years 2023-2025 too. Further first chapter includes research background, aim of research like objectives, scopes, research questions, and research schedule and structure too. The second chapter has been designed to open present literature reviews of AI impacts. In addition to this, thematic research questions focus on FFA steps in AI process from user point of view.

Third chapter describes closer methodology and empirical framework of qualitative research type, continuous improvement as a theory, key words like knowledge and capability related to artificial intelligence and data collecting in methodology and methods of research study. Case study research focuses FFA artificial intelligence use and culture in organization, research questions, as a scope of the study: Rural Areas and Rural Development Department, technical assistance and developmental practices. Chapter opens models of processes, approach to Hyrrä-online webservice, automated decision-making in public sector.

Fourth chapter summarizes results of the research. AI benefits in public sector administrative and implementing organizations by gathered information, steps towards AI and analysis as results of the research study including answers to research questions in theme interviews.

Fifth chapter has conclusions and discussion. Finally, chapter establishes a base for

future research studies, proposals and a new model to further AI research orientation, process and researcher's own estimations about generative artificial intelligence, trust-worthiness and practical implications and elements for further research, workshops and projects.

2 Literature review

AI has important role in the Finnish Food Authority because entire world seems to be in the era of technological changes towards artificial intelligence. This includes use of many tools, strategies, visions and orientation even to ethical points of views to take under serious consideration generally in public organizations in Finland, Åland and in whole European Union.

Behind these practices there are aspects to be taken into consideration by literature review like organizational structure, strategy, processes, strengths, enables, barriers and our learning skills, or education to use for instance generative artificial intelligence (AI). Research questions have set to explore closer Finnish Food Authority, Rural Areas Division and it´s steps on AI use and specially exploitation of AI for technical assistance.

It is important to find ways towards utilizing AI towards service-oriented and modern technological public administration. Research studies **what kind of learning situation we have** now for AI-use, and **which are next steps to achieve more knowledge and capability to needed future direction**. Further as a researcher I focus steps which are in implementation process important. How manage artificial intelligence (AI) for technical assistance administration in European Agricultural Fund for Rural Development (EAFRD).

Research method lies on quality research and research uses Hyrrä-online webservice data and data of technical assistance support. On the other hand, this research images how AI (artificial intelligence) integrates processes, functions of strategy and data management model in one public sector organization in Finland. According to Puusa, A. and Reijonen H. (2011, 19) human resources in organization mean experiences and expertise, which can be seen as common or community capacities. With this organization it is ready to solve customer problems and create value for customers.

The ability to secure the AI benefits is valuable. In FFA we could avoid AI risks. Our benefits from AI and digital technologies can be useable if they evolved with the strategies certain needs, are interesting, even languages, and targeted contexts to our customers in public sector. Digital technologies are not risky to use data by AI users. If there are wrong algorithms and failed data available, it requires risk management, awareness of our perspectives on knowledge (Nonaka, Ikujiro and Nishiguchi, Toshihiro. 2001, 31) and even regulatory guidance which can help to use AI correctly. The ability to secure all AI benefits is very important. This all means more AI education or studying step-by-step.

On the other hand, Dwivedi (et al. 2023) noticed that data analysis is a part of data science and as a science field it is an extremely fast developing and growing in the world. Finland had high-qualified seventh place with AI-articles in 2013-2017 in top science magazines or papers. When looking at EU-countries, Finland is fourth in publishing AI-articles in top science papers. Hongkong has been a leader in publishing top articles from AI. At the beginning of artificial intelligence use in organization, there are various aspects and issues to think about and regard to.

One of these things is vision of FFA and open data, which is categorized net page data for all Finnish public open data which has one category for our FFA field (Figure 7).

Figure 7. Open data category for Agriculture, Fisheries, Forestry and Food.

Open data net page by Ministry of Finance (2025) data shows how simply can summarize that by public values and principles, method or technique and tools like AI can reach intended results. Thus, this kind of action leads to the benefit of organizational customers and administrative authorities. The process becomes a habit and a way of thinking.

2.1 Artificial intelligence in public sector

Artificial intelligence (AI) can be defined as “machines or computer systems capable of learning to perform tasks that normally require human intelligence” (Fosso Wamba et al., 2021). AI can be regarded as strong AI referring to proactive thinking and independent decision-making typical for humans and weak AI referring to a system which can achieve specific goals, which are easy to achieve (Buntak et al., 2021). Web service for EU support payment data is launched yearly by FFA. Last time this data has been published was 25th of March 2026. (https://www.ruokavirasto.fi/en/about-us/published-datasets/web-service-for-eu-support-payments-data/)

Windrum, P. and Kock, P. (2008, 4) writes, that public sector daily business consist of political, social and technical skills which should be managed alongside knowledge of employed persons. Windrum (2008, 233) also noticed six forms of innovations which public sector can use: 1. Service innovation, 2. service delivery innovation, 3. administrative and organizational innovation, 4. conceptual innovation, 5. policy innovation and 6. in finally systematic innovation. I assume, that we could manage to use just part of these innovation forms at the moment but we could manage to use all of these efficiently with artificial intelligence tools until we just learn more about AI as an innovator role and about our enormous amount of data.

It is significant to notice that **Artificial Intelligence Act by European Commission regulation** came into force on 1st of August 2024. This regulation on AI shapes more Europe´s digital future. It is important to become and be aware of the condition that according to the European Union´s AI Act (article 4) Finnish Food Authority must have in its AI systems ensured measurements of persons AI literacy and suitable levels of AI skills with knowledge of AI opportunities but also risks of AI use.

AI Act will come in full force 2026 but has been applicable since beginning of 2025. Finnish Food Authority (371/2018) has more transferred administrative tasks due to amendement in the Law of Finnish Food Authority 670/2025 1§.

Berman, A (et. al 2024) writes on Technology of Science (76(6): 102471) about Swedish Public Employment Service (PES) and AI with digitalization efforts. According to the article, AI relates to public sector trustworthiness and services and even decision-making processes. Advanced AI technologies and personnel skills with knowledge of organization are facts which are very important and topical in this AI in public sector.

Recently started new pilot project for agricultural data transferring by two Finnish public organization: Natural Resources Institute Finland and FFA. Competitiveness issues with farmers in Finland are also involved in this test pilot. These kinds of pilot projects can open new enhancing AI possibilities and common data management for public organization to develop services and learn more of AI reliable use.

Fosso W. (et al. 2021) seemed that AI could be risky and disruptive, unknown technology which could force us to change almost everything in our society. AI society must believe and aim social impact by minimizing all risks with AI but also invest in security, educational challenges and public sector management. That is a way toward AI society. There are two forms of AI: strong like human intelligence and then weak AI. Weak AI is the most common and it simulates human intelligence in specific problem-solving domains and ability for example to learn. In the world AI research covers 149 subject areas. Areas could vary from deep learning to natural language processing or machine learning based on AI capabilities enabled. USA (Stanford University), Iran and China are leading AI research countries.

2.2 Capability and knowledge

Cui, S. and Mao, Y. 2026 found out that AI use **capability** and AI **quality** are involved in their resent research streams and research directions for future and AI guidelines to

managers how to implement AI processes while achieving benefits sustainable. Learning organization has capability to regenerate and change its functions as needed (Kinnunen, M. 2010, 20).

Capability is not the same than productivity as a development tool, but both have very positive impact for instance in our rural development and environment. Capability is person´s ability to do something smarter. Situational analysis is needed when happens strategical changes. We can talk about SWOT-analysis for strengths and weaknesses (in internal environment of organization), opportunities and threats in external side of organization (Williams C. 2017, 113). This kind of analysis helps us to keep internal weaknesses far away from our organization and determine more internal strengths. English words maturity and capability are remarkably close words or concepts in this research.

It is noticed that higher productivity reflects to higher production and amount of foodstuff, working hours, better services or even better use of all available materials and tools like AI. Improvement of Finnish agriculture on common market from competitiveness and success would increase faster productivity (Niemi, J. and Ahlstedt J. 2006, 56).

Core capability seems, that it is not so visible. This means, that capabilities could be problem solving processes, even organizational culture or decision-making internally. These issues determine clearly how capability inputs can be turned to outputs in organization (Williams, C. 2017, 113).

Knowledge in bureaucratic organization is led by rational-legal authority, and experience and expertise are used to achieve goals as effectively as possible. Organization consists of data and way to use information. Knowledge is how organization learn about mistakes (Kinnunen, M. 2010), use their data and ways to develop too. Knowledge relates more to organization process capability than individuals' skills. Data Management Framework of FFA (Figure 8) shows how mix of different kinds of data can be as clear

framework like organizational strategy expects and how we can use and save our data for future personnel by this one data model.

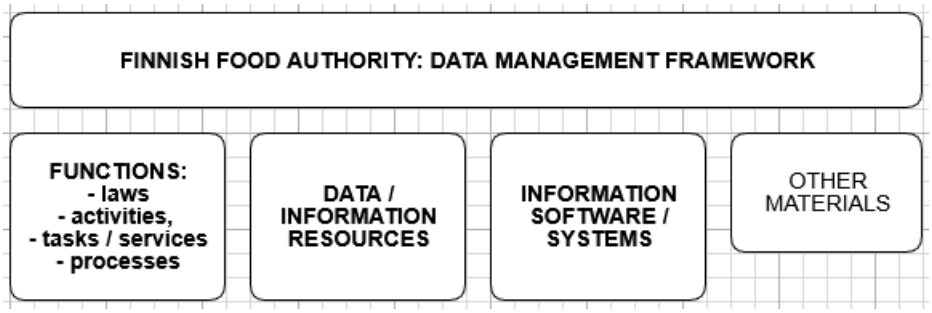

Figure 8. Finnish Food Authority Data Management Framework. (Prikka Intranet work page. 24.2.2026).

According to Japanese (Nonaka & Takeuchi, 1995) knowledge creation called “The 4C model” means that, **knowledge is created by organizations between formal, documented explicit and more experimental like tacit knowledge**. 4C comes from modes: Capture, Curate, Connect and Collaborate and modes consists of four spirals in knowledge creation processes.

On the other hand, SECI-model (Nonaka & Takeuchi, 1995, 62) consists of socialization when quiet, tacit knowledge changes to explicit knowledge. Externalization happens when quiet knowledge goes to explicit knowledge. Thirdly, happens combination of explicit-to-explicit knowledge and finally explicit knowledge reacts again tacit knowledge (see figure 9).

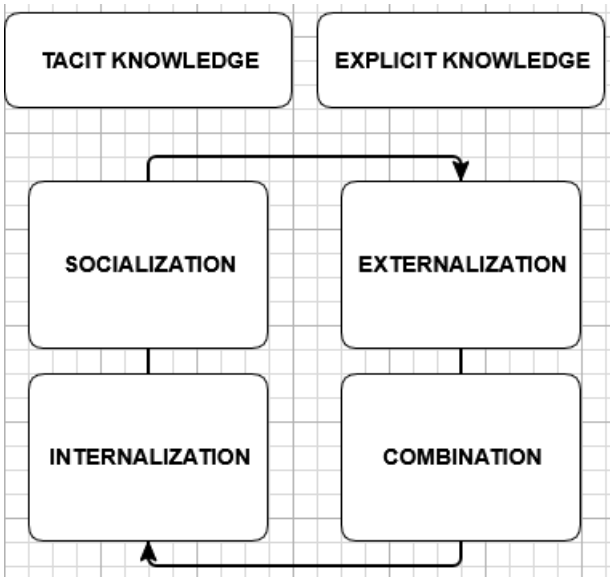

Figure 9. Modes of Knowledge creation (Nonaka, I. & Takeuchi, H. 1995, 71-72).

Hannula, M, Kukko, M. and Okkonen J. described (2003, 29) own budget to competence management and organization measuring practices for competence and knowledge. It is interesting to study, there are the same themes: lack of budget euros and lack of competence and knowledge management, still relevant issues in FFA.

Like Hannula etc. (2003, 39) assume, it is essential to focus on the theme to know who in organization knows what AI might have solution to solve that kind of dilemma from databases of personnel administration. This kind of AI data source could be found for instance from saved personnel AI knowledge level and data of AI experiences or information of AI educations and attended trainings.

In addition to this, various levels of systematic AI training and increasing competence are needed and an organization artificial intelligence technology, operational and management teams are necessary in the future. Thus, we can build whole, customized, functioning AI management model and modern guidelines for our own generative AI use with continuous learning and long-lasting improvement based on customer friendly data products and services. For future public sector services, we go towards rural policy report of visions 2040. Report is published by the Finnish Government (2026:14).

We should have more knowledge about GPS- and GIS-technological needs and advantages. GPS means Global Positioning System and GIS comes from words like Geographical Information System. Using AI in processes like problem-solving is arising in public sector where AI training for new AI technologies can help whole society or even retrain suitable programs for new employment (Rouhiainen, L. 2018, 133).

2.3 Lean management and continuous improvement

Artificial intelligence can be used in **lean management** in process improvement as well as for the forecasting of demand (Morales Matamoros et al., 2025; Tashkinov, 2024). Lean management is used to continuous improvement of processes, and it is used to reduce costs like poor quality, improving financial performance and satisfying customers (Mamoojee-Khatib et al., 2025). According to the **lean thinking** an organization should try to create value and eliminate waste, such as over production, waiting, transport, inappropriate processing, inventory, defects and motion as well as underutilization of employee skills (Monteiro et al., 2024). Claus Hüsselmann (2024, 20-21) noticed five core principles of lean thinking like aiming for perfection, defining value, identifying value and finally implementing pull and flow. At the same time, we should avoid waste. The most important definition to lean management is value to the customers.

Artificial intelligence (AI) may have positive impact related to employees´ engagement in lean organization AI development offers the potential for significant positive benefits and impacts for emotional, cognitive skills and physical things, even society if work environment is human-centered and managed by lean methods. (Tortorella et. al 2025)

Majeed Basima and Frikha Ahmed (2024) studied impact of AI, which is related to the role of AI as a supporting and activation tool of lean management and its benefits in industrial companies. The research analyses how AI as a complementary tool and in automotive manufacturing and equipment companies practically has improved administrative working and whole lean system management.

Continuous improvement refers to organizations' systematic and never-ending efforts toward improving the quality of their products, services and processes and thus operational performance (Kokkinou et al., 2024). According to Monteiro et al. (2024) continuous improvement (CI) has significant role in organization´s performance improvement, making sure quality and optimizing for instance organization digital services. There is specially lack of approaches in food services management, which is usually human-related.

Moraes Filipe (et al. 2026, 196-231) has noticed that operational excellence could be challenging but can be solved by recognizing one, two or three capabilities in company which can bring organizational benefits. These capabilities are related to quality management, competitiveness and could gain more other potential operations. Capabilities are classified by themes like cultural, financial, leadership and technical performance. Field of such long-term perspective company´s operational excellence is still unexplored.

In FFA AI using context and whole Rural Areas employee's ability issues fit to continuous improvement through Total quality management (TQM), because this style management analyzes organization and gives permanent atmosphere to provide and produce valuable and needed products and services to customers and public administrative partners. It is important that according to Nonaka, I., Konno, N. and Toyama (2001, 13) organizations can invest in defining and creating problems instead of solving their problems and after all organizations can develop new kinds of knowledge to solve problems interactively.

2.4 Summary of the literature review

Literature review indicates that FFA has quite similar issues, themes and problem solving like knowledge, capability and lean processes which need management steps by strategies and laws towards future artificial intelligent orienteering and continuous improvement in public sector. When we ask: **What process steps need to be taken in Finnish Food Authority to be able to use and exploit artificial intelligence (AI) in Rural Areas**

(Division) in future years? Answers are sought mainly from literature reviews and some of answers by specific research theme interviews.

As mentioned earlier: **“Continuous improvement** refers to organizations’ systematic and never-ending efforts toward improving the quality of their products, services and processes and thus operational performance (Kokkinou et al., 2024). According to Monteiro et al. (2024) continuous improvement (CI) has very significant and important role in organization´s performance improvement, on the other hand making sure quality and optimizing for instance organization digital services. There is specially lack of approaches in food services management, which is usually human-related.”

Because Common Agricultural Policy (CAP) is enormous and commonly used policy for all EU countries launched in 1962, it is impressive how we use these resources and data reserves in Finland by the EU’s budget. For 60 years times have changed, that now European Agricultural Policies allowed CAP strategies implemented so, that CAP can be planned more at national level and that way get better financial targeting work done**. It is significant to prioritize operational excellence which is a key to success in digitalization service requirements and enables.**

On the other hand, the most interesting question is anyhow how we have capabilities to use our enormous, for instance CAP data information in our organization and develop our important customer services with AI in the future. **How does this use of AI enhance the development towards service-oriented and modern technological administration in technical assistance process?** Answers are discoverable from literature reviews of artificial intelligence, capability and knowledge context and FFA Rural Areas models of development processes with lean and continuous improvement methods.

According to Mäkinen and Naarmala (Laakkonen, M, Lamminpää, S. and Malaprade, J. 2011, 18-20 (Ed.) virtuality needs two kinds of understanding of reality and virtual reality can be simulated by computer. Virtuality like internet has changed communication between person to person, ways of keeping tough, communicating and even real time are

now easily possible. This is possible also with using Hyrrä-online webservice around the clock and regardless of location.

Before recognizing AI capability in organization to do developmental steps, it is important to have a look into main tasks and processes and present “bag” of different tools available like knowledge and competence in the organization. It is not known if there is enough artificial intelligence education available on the market for suitable parts of CAP-strategy implementation and technical assistance process. Personnel information, which includes all training with AI too, is good to register that new AI courses can be taken into the learning program.

Finally, we can ask ourselves **What kind of capabilities and knowledge are needed to use AI today and in the future?** In the future we need to focus more carefully and more on risks with AI too than their impacts and forces because there are many ethical issues, economic aspects, technological performance and still unknown areas with AI. Answers to this third research question can be found from FFA network of AI intranet work pages and from literature reviews, by theme and individual interviews and AI education materials.

According to Nonaka & Takeuchi (1995, 71-72, 104) organizations have tacit and explicit knowledge which both are necessary to notice with thinking suitable developmental steps with AI in FFA. Some of these steps can be short periods of time like sharing and piloting tacit knowledge among own team members. Some longer period developmental aims like building prototypes. In addition to this, Moraes Filipe (et al. 2026, 196-231) noticed that few capabilities have long-term influences on operational benefits and competitiveness.

I noticed that there are not so many research studies yet available which study specifically AI capability, knowledge and continuous improvement while taking steps toward use of AI in public sector implementation rural areas processes. The focus in this research study is on our functions which are based on laws, operative activities, tasks and services

to our customers via all our processes using our massive data, information resources, information software and information systems. Buntak (et al. 2020) writes in International Journal for Quality Research, that analyzing large amounts of data like in health care AI helps decision-makers in processes but warns risky development of AI which can substitute possibly humans and even misure AI system. Buntak continues, that we need different kinds of everyday developmental policies and developing policies and ethical advice to use AI.

For instance, AI could do speech recognition, autonomous planning and decision making, autonomous scheduling, logistic planning, machine translations, spam fighting, even vacuum cleaning and game playing. Some of these abilities could fit very well into public sector and authoritative AI use. With Public subsidies fraud identification process could be implemented more cost-effectively by AI. Referring to Kokkinou (et al. 2024) FFA as a public organization, we create cultural performance financial performance by our digital services, leadership by EU and national rural areas strategies and lawn and technical performance by our digital technological solutions and software systems.

Williams C. (2017, 125) sees, that it is important positioning your products and services via focus strategy to limited, targeted customers. This happens in Finnish Food Authority Rural Areas and especially with technical assistance subsidy, which is focused straight to public sector authorities as customers, technical assistance users and regional, public authorities. Even in history Max Weber (1864-1920) spoke organizations which had authority and rules (Williams, C. 2017, 30).

How about available data which we can use in our work tasks in public sector customer orienteered. According to Williams Chuck (2017,19) self-managed teams can create productivity with creativity and decentralized when employees are closest and most knowledgeable about customer and problems.

Further seems, that holistic approach (Kokkinou, A. et al. 2024) with AI, research and laws in force can bring best knowledge and capability skills to our public sector and future continuous improvement. Although this study does not examine customers' AI needs nor knowledge and capability, I predict that FFA AI services and AI culture with use of enormous databases are highly classified, responsible, and finance models are suitable in public sector. Leadership strategies and technical support with digital services and processes are expected to be user-tested. Networks with other public sector organizations give this wider approach.

In future development processes can give constructive research a lot because constructive research might bring new for our organization. Researchers could call into development process customers to brainstorm service design which can be quite useful. Group discussions could help future service users too and in learning process or as a facilitator researcher might have visible role (Moilanen, etc. 2022, 89). I summarize that customer needs, our data knowledge and ordering, data quality, AI risk management, management commitment and used technology are key points which can give us capable and effectively manage solutions and systems through laws, strategies and processes with AI.

3 Methodology

As mentioned, Finnish Food Authority is responsible for the CAP support types by granting, paying support and reporting on the use of these supports and funds or support types. These support types are from the European Union directly for agricultural guarantees and rural development in Finland. As researcher I focus mainly on rural development funds. CAP periods usually last five to ten years with same legislation and strategy.

This research consists of mixed methods because in this case study can obtain many-sided pictures of situation what we like to know about natural organization environment. Also, in organizations like the Finnish Food Authority need new kind of excellences specially with AI in their developmental tasks and research-based methods in development works. By scientific research aim is to provide totally new models and theory. In this research study aim is collect data from theorical sources and in practice, so we can solve problems and larger our knowledge about AI in the Finnish Food Authority and collect data and experience for technical assistance automation process. Case study indicates often behavior explaining present situation (Moilanen, T., Ojasalo, K. and Ritalahti, J. 2022, 22, 23, 29 and 72).

3.1 Qualitative case study

Qualitative research type is basement of this study research because research questions are how? we are ready to use artificial intelligence in public sector and in specific situations, ways and purposes in Finnish Food Authority and Rural Areas and paying agency subsidy processes and webservice.

Also, qualitative research tries to find explanations and answers why. To certain phenomenon like do we have needed knowledge and capability to use artificial intelligence in our daily work tasks and are we aware of our competence as a public sector organization

about technical innovations around AI and our future customer expectations about services and administrative strategy targets.

Case study research focus on Finnish Food Authority organization and more focusing into Rural Areas as a division level and their artificial intelligence knowledge and capability via available material in internal channels, pilot materials and theme interviews. Also, in this case study researcher has collected electronic material by Hyrrä-online webservice and different reports and legislation especially belonging to implementing EU-financed support called technical assistance. Theme interviewees participation has been sampled randomly because members of internal AI network workspaces could freely take part in these theme interviews.

Case research has theoretical part and empirical research part. Theoretical part consists of literature of scientific reviews of AI and continuous improvement theory. Present research reviews support the case study phenomenon of understanding more about AI knowledge and capability in and between public sector organizations and governmental (Ministry of Finance) side as AI learning goals.

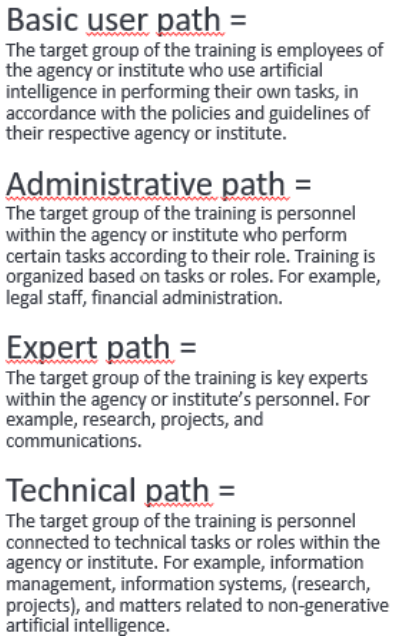

Figure 10. AI-network education material in FFA (Laurila P. 2025).

Empirical part of the research study has mixed methods which consist of theme interview answers and understanding of qualitative and case study research. Opening key words and process models by implementing FFA Rural Areas subsidies and customer services with AI. Alongside these data of FFA in internal AI network intranet workspace is important through existing AI status from organization developmental practices, ways of adopting AI through strategies. Next is list of case study research content:

- AI theme interviews
- observed content of organization internal AI network intranet workspace
- data collection of FFA strategies and organization structure
- type of rural areas supports and processes available
- Hyrrä-online webservice data

Finally comes presentation of solutions for future AI steps which directs our actions in the right direction. Customers expect that processes fit for their purpose and processes do the right things (Karimaa, E. 2002, 12-13). In organizations visual process diagram illustrates usually name of the process, function names, order of operations and the performers of the activities (Karimaa, E. 2002, 18-19).

3.2 Data collection and analysis

Qualitative method part includes interviews which have implemented by individual interviews with thematic AI content questions. Longitudinal data consists of our Rural Areas organization, data from CAP 2023-2027 strategy, processes and continuous improvement and artificial network content and targets.

Data in research is based on **theme interviews**, and Finnish Food Authority and Rural Areas **strategies, visions and processes**. Further on in the research center is an individual interview and **artificial intelligence internal network materials**, **lean and continuous**

improvement philosophy as a theory and as a case **Hyrrä-online webservice** for one support type implementation with DevOps-modelling (see figure 11).

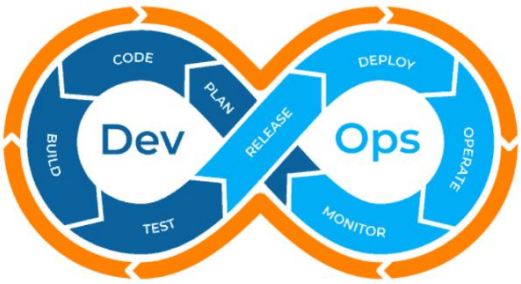

Figure 11. DevOps-model in organization iteration implementation stages. Prikka Intranet work page. 1.2.2024.

DevOps-modelling is base of quality checkpoint in implementation and development of online webservice, too. Researcher made questions for theme interviews together with Professor Ville Tuomi from University of Vaasa and Research director Liisa Maunuksela from Finnish Food Authority. Theme interviews with sixteen questions and five different question categories (A-E) were taken at the end of October and November 2024. One more interview was taken February 2026 when FFA got a new leader for AI-network.

Empirical data collecting started 1st of November 2022 when there has established the first Finnish Food Authority artificial intelligent (AI) intranet work page and AI network. The first AI-ideas for suitable needed use and users have collected by this work page and AI network. One AI example case from Rural Areas Rural Development Department was a pilot with Hyrrä-online webservice data by webservice vocabularies.

I as researcher have collected AI-ideas and needs from open internal AI-network work-space. AI-coordination started on 11th of November in 2022 in FFA by over ten enthusi-astic experts which aim was to find out what kinds of needs we have related to AI-pilots. Beforehand there was a need to study how we can learn more about our enormous Hyrrä-online service data. We piloted application words of Hyrrä-online webservice and wrote blog of results to Prikka intranet 25th of 2022. Another interesting and topic

artificial intelligence blog was published 20th of March 2025 in FFA intranet: “How to add effectiveness in software development”.

Further on, AI workshop 15th of June 2023 was open for everyone in Finnish Food Authority personnel which were interested in exploitation of AI tools. Own artificial intelligence chat, mattermost-channel has opened to Finnish Food Authority 20th of October 2023. Everyone can read and chat on this channel anywhere and 24/7. First FFA AI webinar was held on 24th of November 2023 and many organization representatives from different departments participated seeking AI knowledge and capability to use AI.

Research data which has collected from Hyrrä-online webservice is quite narrow and related just to one part of subsidy process. Due to this, Hyrrä-online webservice is as a constant tool for researcher itself in technical assistance implementation process which is an example of one rural developmental national funding process. Besides theme interviews there have been available for research study specific questions in artificial intelligence network pages of organization and new AI-chat Mattermost-channel with related artificial intelligence conversations and shared materials.

Interviews of Finnish Food Authority artificial intelligence network members and one additional interview are methodologically significant for the research. Also, artificial network content and processes of implementation in support services for our customers in Finland are key points. Interview questions have been planned and evaluated with FFA case organization director of research. The whole research study has current AI topic from head of Rural Areas.

3.3 Validity and reliability

Interviewee candidates have chosen from FFA AI network volunteers which can give as members of that network answers and current data via their own experiences. In addition to this, our head of Rural Areas has chosen as an additional candidate to this research study because he has wide knowledge about the whole division AI current state

analysis, AI-expectations, and resources toward future AI-steps. That gives also to this research study better validity. After all candidates are having own AI experience as an AI user or they are just interested and ready to analyze of using artificial intelligence at work tasks. Candidates have had little AI-pilots as a test too. Validity grows also what kind of terminology is in this study use (Hannula, M., Kukko, M. and Okkonen, J. 2003, 42).

Theme interviews organized by interview survey by Teams and were about one hour long. There were 6 interviews altogether and answers were decoded to excel question by question. Answers were anonymized because it doesn´t matter which part of FFA, Rural Areas interviewee takes part in this survey study research. It matters what are the answers to this theme interview about our AI capability and knowledge.

Research study includes interviews and answers to research questions. Answers gave relevant information about present situation about Rural Areas artificial intelligence use, knowledge, capability and future expectations. In this point, validation means that this study research measures exactly what it should and what it needs to be studied (Tuomi 2009).

Ethical points of view in the research study forced us to stop and think about how one-hour answers can be written ethically and anonymized. Finally, researcher decided to open theme interview answers generally because aim of the research study was to get general information about research problems and information where we are on the way towards artificial use in particular public sector field and one rural development support type. Like it is said, that “studying never ends by studying neither writing by writing” (Viskari, 2003).

Reliability in research study measures research repeatability. In other words, same research study must be repeated a second time similarly (Tuomi, 2009). Research study aim, frame of reference and Artificial intelligence theme seems to be successful in researching given by head of Rural Areas and research questions have evaluated by

experienced testers before theme interviews. Changes have been made to questions by researcher in order that the whole theme interview was logical as much as possible. The results of the research study show that reliability was correct when researcher got answers were easily by every question and time for answering to the whole interview last about one hour every time. Given timetable for interviews looked to be sufficient. If theme interviews repeat for instance this year again, answers will be different because of AI development in public sector use and world-wide.

Objectivity means that as a researcher I realized that data is as objective as it is available and given. This kind of objectivity can be typical and relevant by epistemologist discussions and theory of truth. Impartiality is achieved researcher can see, because in theme interview answers interviewees have given their answers based on their own experience and observations about AI capability and their own knowledge and ability to use artificial intelligence like in developmental work tasks or in team projects and roadmaps.

In FFA we use Jira-ticketing as our project management tool when question is about an operational way to reduce waste, which way we can increase quality, openness and efficiency. It is necessary to do planning steps like thinking as a team how to organize new AI ideas gathering in your organization. Secondly everyone can write down what is going to do with AI. Then after that step is time for common check. In our case, after checking we took actions to find out our resources for AI functions in a short term and a longer term. Finally, we started to get results of our first AI-used pilots.

According to (figure 12) FFA intranet PLAN-DO-CHECK-ACT-DONE are the steps to be taken. These lean steps take about 4 weeks.

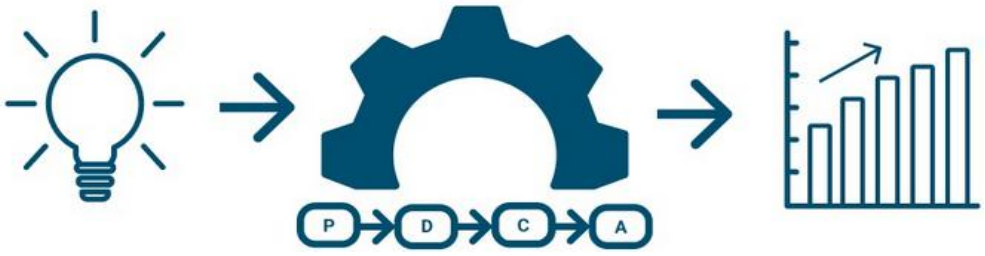

Figure 12. PLAN-DO-CHECK-ACT model

Kanban board (see figure 13) has usually idea of developing or noticing waste in functions which deal with processes by team PLAN-DO-CHECK-ACT. According to Torkkola (2015, 62-63) kanban means a ticket or like a card which can be act as a work task in software development. **Kanban board is a view to see easily where there is a weakness**, for instance in software development process.

My researcher opinion is, that model seems to be very useful in any kind of continuous improvement and developmental work. Kanban board as a tool because it opens pleasant view for continuing development process from start all the way to the end point of the different development cases like in this research study technical assistance process. Kanban board can be used in knowledge-based work like in FFA software developing and digital services, and board works in FFA internal workspace openly and constantly. Everyone can follow on board task tickets from backlog to done label.

Figure 13. Simple Kanban Board

Basic elements of methodology in this study research consist of things how strategy like research method is chosen, what are the empirical data collecting and analyzing tools. Qualitative research is as a method and theme interviews as collecting data tool.

4 Results

Research study questions have qualitative approach, and questions have targeted to find answers to different problems and understand phenomenon. Research questions seek answers categorically by theme survey to AI objectives, targets in processes, capability, maturity and needed technological changes. AI benefits in CAP-strategy implementation and future aspects for research organization have been asked from interviewee too. Questions have classified to five different themes like A, B, C, D and E. Main questions of this research study are:

1. **What process steps need to be taken in Finnish Food Authority to be able to use and exploit artificial intelligence (AI) in Rural Areas (Division) in future years?**

Question 1: answers are sought from literature review and by theme interviews. To this first question there are in theme questionnaire main research question A, B and C. In addition to this also Finnish Food Authority AI network content might answer to this question. As Multimäki, M. shows (2003, 84), that unique process has elements of coordinated and controlled activities as a set from start and finished points and with specific requirements like cost, time and needed valuable resources.

Operation management can be seen from industrial engineering point of view in Finnish Food Authority, Rural Areas and Rural Development which as organization model (figure 14) supports artificial intelligence steps. This research study focuses on Rural Development and further on the technical assistance process.

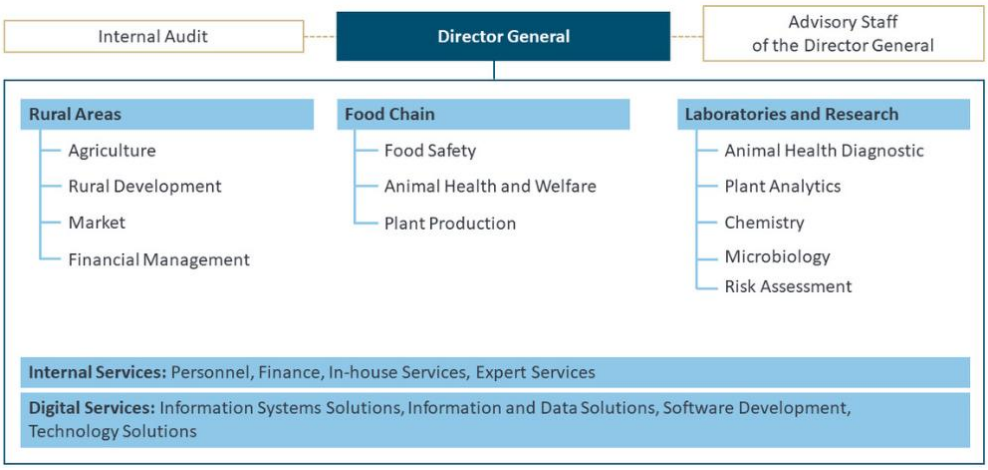

Figure 14. Organization Model: Finnish Food Authority (FFA)

According to Pinja (FFA educational, online platform) which has used to learning and training in Finnish Food Authority and in Rural Areas, we have tasks prescribed by law in Finnish Paying Agency. For clarity different tasks they have categorized into four different task descriptions. Every title has specific content of internal environment, certain control measures, information and communications, and tracking:

1. Internal environment	**2. Control measures**
Training obligation	Conditions for accepting payment requests
Segregation of duties	Payment procedures
Conflicts of interest	Accounting
Professional skills	Performance reporting
Risk assessment	Dept proceeding
Transferring tasks (Paying agency agreement)	Audit trails

3. Information and communication	**4. Tracking**
Communication activities	Continuous monitoring
Security of information systems	Quality control
Certificate requirement ISO/IEC 27001	Internal audit

Resource: Education material (Pinja). Kalijärvi M. and Puolimatka M. 6.7.2024.

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Most of the organization´s administrative tasks are set by legislation. Thus, tasks are necessary to implement by these functions of support tasks for customers orientation and via modern digital services 24/7 like Hyrrä-online webservice. Ruokavirasto has as a main task that we are working for the good of humans, animals, and plants. Thus, we support the vitality of the agricultural sector, too. In addition to this, Ruokavirasto develops and maintains several digital data systems and registers.

2. **How does this use of AI enhance the development towards service-oriented and modern technological administration in technical assistance process?**

Question 2: answers are discoverable from literature review and FFA Rural Areas models of development processes. In theme questionnaire research questionnaire C and D deals with this kind of issues and Hyrrä-online webservice in technical assistance administration. Organization model looks like how FFA is functioning in 2025 (Figure 1 and figure 2). Always when there are operational environment changes near us, it is needed that there is time to make updates also to organization structure and these chances influence also to customers, stakeholders and partners.

Further our partners can be schools, colleges, universities, municipalities, cities, farms, firms, organizations which offer counseling to applicants of these rural funds or people from northern part of Finland by reindeer herding activities.

One of these digital data systems is Hyrrä-online webservice which has launched in 2014. The first customer operated in Hyrrä-online webservice 26th of November 2014. There are over forty different of supports in Hyrrä-online webservice. Every day 500-700 users open the webservice. Online webservice covers over 260 000 applications in mainland Finland and in Åland. As an electronic channel Hyrrä-online webservice is modern system which is used for example authoritative customers like technical assistance process. Different support type process administration and webservice can produce different kinds of reports for users too by Hyrrä-online webservice.

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3. **What kind of capabilities and knowledge are needed to use AI today and in the future?**

Question 3: answers can be found from FFA network of AI intranet work-pages and from literature review and by theme interviews. Also, in questionnaire theme E gives several answers to AI use in future.

Today through automated decision-making it is an advantage if we as a human beings could maintain oversight for AI and of course misunderstandings with automated decision-making. Algorithms which make decisions for us must ensure by humans. This way algorithms giving results can better match their purpose. This includes that humans usually should check and oversight testing and impacts by human rights.

Our Data Management Model in FFA has saved by ARC-tools (Annotated Research Context) and there has also stored our descriptions of operational environment of Rural Areas processes and data architecture. Our research data management model has been drawn by ARC-tool and if necessary, it will be updated (Read: Prikka-intranet, 9.9.2024).

Creative AI is same word as generative AI which means technological systems and solutions which can create pictures, texts and other kinds of information by trained models. These systems and solutions based on language patterns can be utilized widely for instance by OpenAI ChatGPT or Microsoft Edge Copilot.

According to Mäki, K. & Sorri, T. (1999, 55) in public sector quality of services and competitiveness are “going hand by hand”. The organization´s management sets goals for public services. This means that services have very much social significance or services need attention. Also, assessment of competitiveness must be wider than only service users. Assessment of competitiveness affects the whole society. Usually in public sector there is no competition at all, but public sector can offer services inexpensively, dependable, and safely. Management can create conditions for internal entrepreneurship in organization which can increase motivation and innovation (1999, 75). I believe that these

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kinds of aspects are related also towards artificial intelligence tools and their use despite the busy with work.

FFA launched new internal AI-group of about fifty specialists whose aim was to collect needs and use pilots of artificial intelligence from whole organization. We opened 11th of November Internet workspace and started to save ideas and needs for artificial intelligence and some AI experiment´s (pilots) materials.

This network was a successful step. All participants were able to see what kind of AI openings and some innovations colleagues have been made and what kind of need they still have in AI future. And what kind of ideas, possibilities, and challenges we have in one year, 3 years and 5 years. Via this new network of AI, we were easily capable of changing varied materials like international articles, AI policies, strategies, discussions of ethical AI-issues and even AI-videos in YouTube.

Theme interview research questions (Appendix 1) have used that theme interviewees can talk openly about their own motivation, ideas, and proposals for the future AI impacts. Questions were tested by Liisa Maunuksela who works as FFA research manager.

4.1 The steps needed to be able to use and exploit artificial intelligence in the future

The most part of this research study results were collected by theme interview which took place at the end of 2024. Today, theme interview answers could be different because of fast AI development and at the same time our AI capabilities and knowledge skills develop. Also, needs of using AI change and enhance all the time.

Researcher has sent interview questions to Liisa Maunuksela for testing. Liisa works as a director of research in Finnish Food Authority. Totally interview request has sent to twenty-five personnel of Finnish Food Authority. Answers to research questions have

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gathered by theme interviews which have been designed to gather commonly by artificial intelligence network and through the members of this new network.

Researcher as the network coordinator, opened workspace for whole organization staff which helped to gather open ideas and planned needs toward future AI-steps in the Finnish Food Authority. In addition to this, there were theme interviews which gave more specific information and answers to research questions set. Questions for theme interviews were tested by Finnish Food Authority research director Liisa Maunuksela beforehand. Liisa Maunuksela read this research study thoroughly in the end of writing too and gave valuable advice to the researcher.

Firstly, we liked to get to know each other and tacit and explicit knowledge levels and skills. Secondly, we needed to share our original AI thinking via inside network. Everyone who was enthusiastic was able to fill in information in this new network workspace. Everyone was able to notice different time scenarios when AI would be helpful to the needs of AI-acquisition or piloting something with AI. By filling in information from colleagues to workspace it revealed what kind of steps or pilots have already done with AI.

Workspace was easy to fill anytime, anywhere and it was open for AI-links too. Workspace is for internal use only in Finnish Food Agency and it has presented in Finnish only. Workspace works in the way that everyone could fill information of AI-membership and fill AI-needs or ideas by three different time periods: 2023-2024, 2025-2026 and 2027-2029. This way all could see easily what kind of the first scenarios of our AI-performance and written AI-targets will be in each period.

All these problem-solving cases have been managed and done through Artificial Intelligence Network members (over twenty staff members). It seemed, that key for AI problem context in the Finnish Food Agency was: How our new network in The Finnish Food Authority can see artificial intelligence and objects of its use, AI future development steps, ability of our organization to utilize AI and gain competitiveness by recognizing

factors for competitive advantages. in our Mattermost-channel there has been discussion about our future steps with artificial intelligence and how we got new members interested about AI solutions and different technical issues and ethical points of view. This work expands fast.

Six personnel interviewed during 31st of October until 15th of November 2024. Beforehand theme interviews researcher sent to every participant research questions, that there was a few days' time for preparing answers to research question in English and same instruction by e-mail for one-hour Teams-session for theme interviews. Research study questions are seen in Appendix 1. Next, each question from one to sixteen in five different categories gathers following answers:

Question 1: What kind of needs are there in Finnish Food Authority to use artificial intelligence (AI) in 2023-2029?

Based on interview results, FFA has smaller and bigger needs for AI-use. It is important to create AI-culture and implementation services for customers with AI. FFA has collected ideas. Common and proper tools for AI must get familiar, that FFA can join AI-projects.

"In public sector we have many needs small and bigger to use AI that makes our work more effective and also easier because AI helps us to work in the future in a different way."
"Many needs in implementation tasks when planning services for customers."
"We do CAP-strategy 2023-2027 implementation tasks, so we need AI to help our certain routine work."
"Many needs are collected already and more are coming."
"We need kind of culture to work with AI and get used to it. See advantages and get low-level skills."
"We need to wait what kind of AI tools whole public sector is taking so we could maybe involve in AI-projects."

Question 2: How does our strategy take care of our AI-objectives?

As a conclusion to question is, that FFA needs by coming new strategy guidance and direction related AI themes customer-oriented, more education of AI and short steps with AI-use.

"Our new strategy is including tasks for future AI achievements specially in information systems and customer services."
"We will see but I am sure there are AI objects in discussion."
"Our strategy, vision and values are just now changing. We can participate our strategy work."
"I´m not very deep in the objectives."
"We can start step-by-step AI-education. Now there is no need for maturity and broader knowledge. I have tested Go Pilot. Need to adapt new work methods and strategy."
"Our new strategy might tell us how and where to use AI. For every AI-case we haven´t enough data."

Question 3: How could our Enterprise Architecture (EA) and Data Management Model utilize AI?

In summary, coordinating AI tasks belongs more to FFA, Digital Services. AI helps in work tasks. Implementation processes are interesting, awareness of available, massive data is essential and report of CAP- strategy results are needed to analyze by AI.

"There are many ways to utilize AI in EA (Enterprise Architecture) and Data Management Model like our processes into online services and open AI solutions."
"Digital Services takes care of this part by coordinating EA developing and Data Management Modelling."
"Our implementation process aims to results which are for many people important and interesting."
"Report of our CAP-strategy results is number one where I could use AI by analyzing big data mass and lots of different numbers that I´m able to make many analyses and estimations."

"AI not just for making funny speeches. It is really helping work to go through massive information packages, testing or application applying process."
"We can make pilot-testing with different AI-tools if we are aware of available data sources."

4.2 AI and development towards service-oriented and modern technical assistance process

Answers to this headline about AI and development on service-oriented process can be seen by theme interview questions from four to nine and answers to these same questions as follows:

Question 4: Have you already used AI in your work tasks? If yes, what kind of Experiences have you gathered?

Artificial intelligence, maturity and capability is still at low level. We need more learning and testing with AI.

"Yes, some title testing."
"We need more learning how to use AI in our substance work."
"I have made little tests with AI if it gives right answers."
"Now we have couple of people using AI. The rest are thinking is AI needed. No maturity/capability."
"AI can help us to focus on certain solutions in work tasks, or it can boost our operations."

Question 5: What are the enablers or strengths to reach the objective?

FFA has as a strength, that learning, knowledge, and money has available for AI. We need to choose suitable tools for AI, so that we can find safe information and we need to know data. AI can be teachable.

"Right AI tools for its purpose."
"Strengths are that we have learning and knowhow to use AI and money to acquire applicable AI tools."
"I think we can expect some results with AI, but we have to guide and teach it."
"We need to know own data thoroughly."
Technological way it is easier to understand how to use AI. I need data of double financing or safe information sources and overlapping operations."
"It is wise to go step-by-step with AI when we have technology and it´s tools chosen."

Question 6: Why do you haven´t used AI in your work tasks? What are the challenges or barriers to reach the objectives?

At the theme interview time, there are not all tools of AI, instructions, and experiences available, but new strategy is expected. At that time Digital Services had AI tools for software and hard data purposes.

"No basic AI tools and instructions where I should use AI related to my work."
"We need more all kinds of AI learning and experiences how and where to use AI."
"Digital Services are using AI for software and hard data purposes. It is good to involve in AI-networks."
"Technical AI maturity and capability are written hopefully in new strategy texts."

Question 7: Where would you like to use AI with your team?

Answers to question 7 show that AI workshops have held, speeches and presentations making and clients serving with AI good help work and clients.

"I could probably make speeches and presentations through AI in the future and mark points easily."
"We need to think how we serve our clients because world is changing."
"Collecting AI needs is important for making small testing and it grows our maturity and capability of AI."

Question 8: What kind of scenarios and expectations are available to use AI in your work processes for customers/stakeholders?

Interviewees answered that customers bring comments, activities and most importantly FFA existence as an authority. AI capabilities are spreadable more broadly. For customers it is possible to produce reports, analysis, scenarios, and results with the help of AI. It is useful way to ask customers to evaluate with AI our services too.

"I prefer to take our customers to comment etc., our AI test results and activities."
"The most importantly why our office exists for customers. AI could help our work in some points."
"After AI piloting we are capable to spread experiences to colleagues in our organization."
"We can produce quality reports, analysis, scenarios and results to our wide range of customers."
"Customers will maybe fill their applications which have prefilled by AI beforehand, and we could look correct data for mass of numbers."
"We do service work for our customers. So, we can include our customers and stakeholders AI testing with us."

Question 9: Does Finnish Food Authority have the required maturity and capability to use AI in next years until 2029?

Target level with AI needs more effort in Rural Areas and teams but AI learning increases rapidly by personnel and constantly seems needed for interviewee in different work tasks. Ethical points with AI, further education and AI tools are good next steps to achieve. It is important to notice right data for AI from an ethical point of view and possibility to correct data with proper tools.

"No. We have to learn more and take ethical things with AI also under consideration."
"We have some but not enough. Education of AI basics would be good way to start. Everyone doesn´t need AI in their work but some would need it more in several operations."
"In my team there are some knowledge to use AI tools, but we need to learn more."

"Basically, we learn how to use AI when we have proper tools for AI. I need AI for comparing data."
"Right data for correct AI-tool testing is needed. Later we use also different interactions with AI need and with Rural Areas Division needs."

4.3 Capabilities and knowledge needed to use AI today and, in the future

More information about capabilities and needed knowledge for using AI now and in the future could get about FFA theme interview answers to questions like ten, eleven, twelve, thirteen, fourteen, fifteen and sixteen. Core capabilities could really be visible also.

Question 10: Does Finnish Food Authority have the needed technology and tools to use AI in next years until 2029?

Interviewee answers show that some have no experience with AI, some use free AI tools and some use AI-tools by licenses and with customers. Based on theme interview answers, some have a license to use AI tools, but some of have familiar with free tools, but some of hesitate to use AI tools for small AI-tests and pilots.

"We have some tools already to use AI in our work. I do not know about our consults; they might have a lot of AI experience."
"Most of us do not have at the moment."
"Our IT Services has licenses to some AI tools, and they have already tested these tools. Some of us in substance have small AI-tests with free AI-tools."
"We have some tools available but all aren´t free to use."
"We need to know safe and good ways to use AI in small teams and then with and for customers."
"Need to know is AI suitable for all purposes. Some RAC-tests are done."

Question 11: Do we have the needed maturity and capability to use AI as Authority of Rural Areas Division?

Theme interview answers to question 11 gives information that in Rural Areas need more knowledge and education of AI. Only few personnel have information and maturity of AI-use and should be aware that there is sensitive and regulated, substance information for AI-use. AI tools must be acquired by organizations because tools might be between free or expensive.

"In fact, I like to have more knowledge for this."
"Not needed."
"No. We need more education."
"Some people have maybe information and maturity to use AI properly but most of us not."
"Lot of sensitive and regulated information is available, but also open data of substance use."
"AI tools are some free on charge but some of them are expensive, so you cannot by yourself decide all AI tools."

Question 12: Do we have the needed maturity and capability to use AI in Digital Services?

Question 12 is clearly difficult for interviewee to answer, or there is no answer. Two interviewees answer that AI is valuable tool for finding errors, littering and checking text and document. AI language models are more important in the future. As researcher I assume, answers to question 12 might be short, because research theme interviewees represent and deal with their Rural Areas work tasks.

"No more information of this."
"We do not need to make too high AI hopes. We need to teach AI and test it properly. Find errors/littering and checking texts, documents."
"Models of AI language are in the future more and more interesting"

Question 13: How can AI benefit CAP-strategy implementation processes?

Answers can tell that monitoring systems like CAP processes and analyzing huge, possible sensitive data comes first. Need more to know more of AI and how to use AI correctly then we can produce correct analyses, solutions and answers and applying our online webservice supports. Hyrrä-online webservice comes to researcher mind in this point of view.

"Monitoring system, analyzing massive data, applying processes our online webservice supports", "We could develop our CAP-processes monitoring and reporting results."
"What kind of data and our massive information can handle with AI because we do have also sensitive data, but we like to produce correct analyses, solutions and answers with AI."

Question 14: Any other AI recommendations, ideas and/or proposals for the future?

In the future interviewees hope to get more learning, discussions, good practices, pilots, networks, and specific knowledge of AI.

"More all kinds of AI educations and networks and good practices.", "More discussion, pilots and test result of AI."
"AI is not just for making funny speeches and videos. It really helps work with us like fraud prevention, updating websites and dated published information, filling some parts of application, finding exact information, easy cheques, is there old or misinformation. I need more information on how to teach AI or even information on how many quotas in regulations are available."
"Machine learning is not so known for substance."

Question 15: Which are your main partners/stakeholders for future AI dialogue and cooperation?

Interviewees have direct answers from different levels of organizations and people from European Union to our work colleagues and near customers or clients in implementation.

"The Finnish Ministry of Agriculture and Forestry"
"European Union, our ministry, stakeholders, colleagues"
"All our customers in Finland and EU"
"Our government side while leading us."

Question 16: What are the challenges/barriers and what are the enables/strengths to reach the AI objectives as Finnish Food Authority?

Artificial intelligence teaching, suitable, data and common standardization operations are important to ensure that we can reach organizational AI objectives.

"AI teaching is essential that we can use AI in work tasks. Over own specialty there are AI possibilities."
"In the future we need instead of unstructured data more data classification and common standardizing operations and unity data for AI use."

Summary of these answers are not easy to make but some of them are obvious and predictable because researchers work in this research thesis target organization and in Rural Areas. Answers of interviewee display, which teaching and education of AI is essential to work with AI because there are many possibilities with structured AI data. Common AI operations, AI resources and guidance are good to standardize by organization.

Future aspects seemed in last question to be the most distant to give exact estimations for longer use of artificial intelligence capability nor direction of AI barrios, challenges, enables or strengths. On the other hand, those aspects are not seen now, and no-one can predict our future so clearly in public sector today with AI.

See figure 15 how our senior AI expect summarizes in one figure how our Finnish Food Authority information level goes up to AI level.

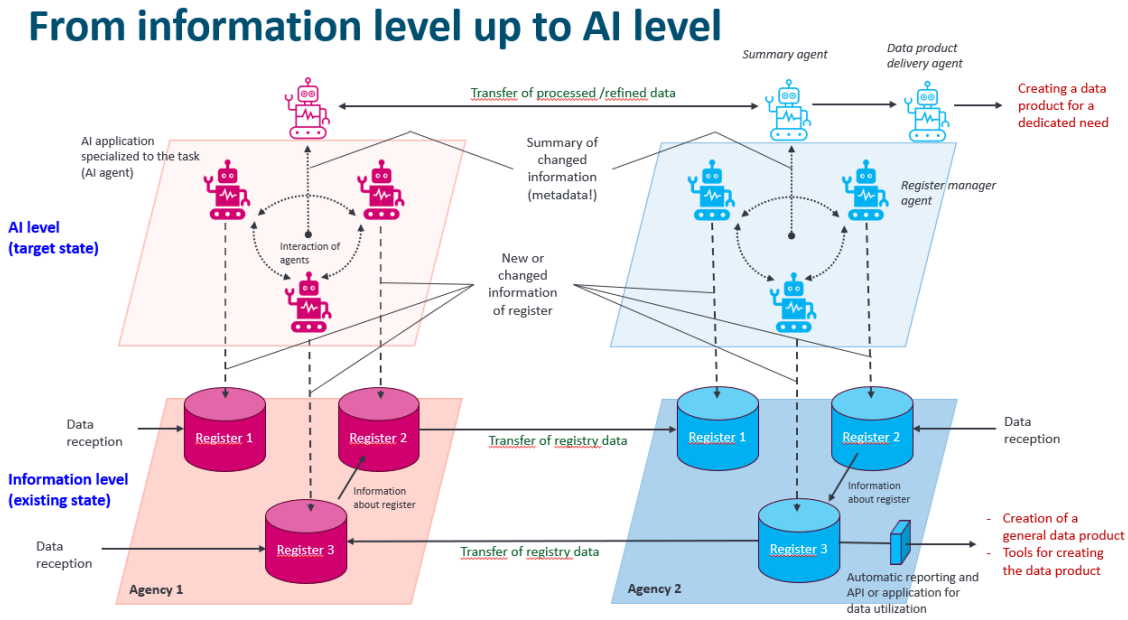

Figure 15. Laurila Pasi. 2025. From information level up to AI level. AI-network education material in FFA.

According to Pasi Laurila´s interview we are on the way to achieve AI level as described in figure 15 from the existing level. In European Union AI strategy lines, as a member state we need to enhance processes with our IT services by European strategies of AI as one Rural Areas member state.

Internal AI network workspace has scenarios, that AI could be significant tool for testing various kinds of situations how apply and fill our webservice applications and collect customer´s feedback, make reports and comparison of different data sources and different texts and calculations. Seeking needed information from mass of information reserves, making expectations about collected data spaces can be difficult to implement and need to suitable level education beforehand.

Technical assistance as one subsidy process and process steps in different roles could be more relevant issue when Hyrrä-online webservice will use new digital user interface during CAP strategy implementation since 2026 and DevOps-model. Laurila continues, that in FFA enables of AI utilization are as follows (figure 16). Important is, that we focus on our present AI capabilities and knowledge and AI-education increasing in the future.

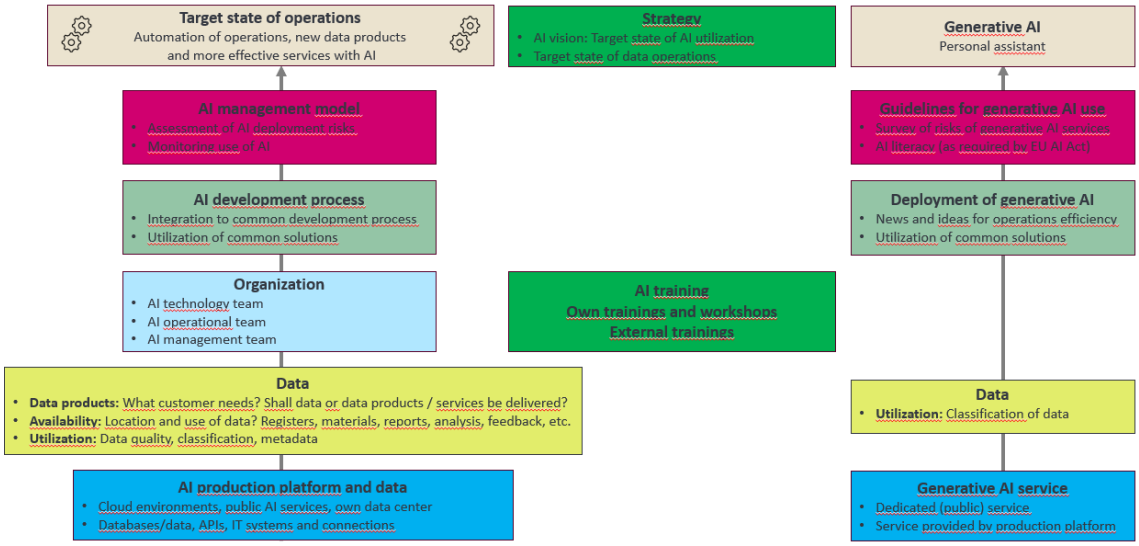

Figure 16. Laurila Pasi. 2025. AI-network education material in FFA. Prikka Intranet work pages.

It seems from theme and individual interview results and referring to Nonaka and Takeuchi (1985, 141) it is prerequisite that we notice our individual level of continuous innovation first at the bottom and after that we continue toward upper levels: group and organizational level with AI. Artificial intelligence our own and external training and workshops from basic level to upper-level skills is the most important step to do now and in the future years in FFA by knowledge creation, by continuous innovation and achieving finally competitive advantage (Nonaka and Takeuchi 1985, 7).

The previous thing is true even we operate in public sector without specific competitiveness on the public services production for our customers and for government stakeholders like in technical assistance and its networks. We need to know our data storage locations and know well our data life cycles and risks to use AI when planning our digital subsidy online services and processes in accordance with the EU AI Act regulation and article 4 for literacy skills in organizational levels.

5 Conclusions and discussions

In the future would be nice to use Hyrrä-online webservice so, that AI will make applications filling on webservice automatically and applying these kinds of rural development supports and subsidies which can be made once during whole CAP-strategy period instead many times during sorter application periods. Of course, technical assistance as a one rural development support type I could see as a pilot and testing support type toward AI adoption, innovation, development, and even important ethics.

Effectiveness of whole EU-process from Commission to Rural Areas in member states could be more direct. Process could save money and time to make even more impacts. Automated decision-making will be aimed in the future in public sector and in digital services of Rural Areas Division including many implementation processes like leaned subsidy processes like technical assistance. As a researcher of this study, I have seen FFA AI-network history because I was from starting point an AI network coordinator for about one year and builder of AI-network chat-channel and AI intra pages. FFA has new AI chief specialist. Already new AI network leader gets a lot done with our organization AI pursuits which relate mostly statutory implementation visions and duties by EU or national laws. Learning, continuous improvement, commitment of management and technological solutions with AI have significant role how we can act to our customers service needs and develop our processes by lean “just-on-time”.

5.1 Conclusion

First, there is lots going on with Generative AI and utilizing AI in public sector administration and functions for customers. World with AI develops fast. Results of this research show that we are forced to step towards generative AI slowly and cost-effectively. We already have European level AI strategy goals by AI Act. We have networks around AI tasks and knowledge and capability creations too. Huge step is to ensure our available data quality for AI and staff’s proper education and learning levels of AI. After all it is

modern to invest in more customer-friendly public-sector web services by continuous improvement (CI). We are aiming individual and team AI learning skills and public sector open discussion nationally and internationally. New small AI pilots with customers are increasing because we need the public sector to learn our service processes while operating environments are changing. I will see that AI capabilities in FFA are clearly involving in cultural and financial performance but leadership and modern technological approaches.

One effective way could be minimizing steps in rural development implementation process in the future because The Finnish Food Authority had cooperation procedures in 2024. Minimizing is not necessary in every subsidy process, for instance technical assistance process is simple and linear technically and process has different authority roles. Also, there are legally task differentiations already in the process needed. For example, same person cannot take care of depositing and granting of support if the person also pays support to applier or customers. Both tacit and explicit knowledge with AI is asset.

Conclusion is that there were three research questions in this research. We can answer them shortly. FFA needs to take the following steps to be able to use and exploit AI in Rural Areas (Division) in future years: need to target in financing EU funds efficiently, find needs where AI could be suitable tools in process by enhancing subsidy processes.

Another need is to learn more about AI and its possibilities, risks and usages. It is necessary to have quality data for different purposes like reports in our organization and participation in AI networks for common AI discussion and developmental planning. The use of AI enhances the development towards service-oriented AI agents and modern technological administration. In technical assistance process we could invest in expertise and learning of AI at different levels and do some little pilots with AI and some projects which we choose for our future AI roadmap including technical assistance automated decision-making co-operation with ten Economic Development Centre´s.

Risk awareness, data organization, AI use needs and data quality are goals for future AI performance. There is a need for some specific capabilities and knowledge to use AI now and in the future, like FFA software development, technological solutions and customer networks. Commitment from management levels towards AI guarantees financial investment money to short- and longer-term periods of development and continuous improvement with AI and possibilities of AI learning stages, utilization and advantages.

5.2 Discussion

There should be knowhow what kind of present mass of data has available to artificial intelligence use. In brief period Finnish Food Authority was capable to open common AI workspace for discussion platform and network channel (chat) which is nice for fast internal communication in experts and head of The Finnish Food Authority. It is necessary to avoid and be aware of risks and ethical problems with AI. Direct impacts of AI use in FFA can be seen when customers are applying subsidies and funds digitally and how easily customers use our web services with instructions of subsidies. Also, when administrative decisions are made mostly electronically and using AI, common administration development processes enhance.

Active AI networks and qualitative paying agency data and proper technology besides research, projects, impacts of subsidies and innovations could be FFF future research priorities. It is important to continue to develop effective AI processes in FFA and Rural Areas that it is possible in the future to set measures, even higher targets and special effectiveness indicators for case organization.

DevOps-model is a perfect key for today´s application development which is always openly in real time concerning about developmental little steps. The model allows steps to go backwards in steps and try again if something went in the wrong direction in development. That is a huge possibility, and generative artificial intelligence can support the model by making and creating updated content, texts and pictures of define online webservice subject matters.

In my opinion, we might also need common autonomous AI-agents in public sector, more sharing open AI knowledge and information and design of organizations and enterprises in future years. To make any automatizing things or services, we should first learn carefully of our main and smaller processes. It is necessary to know how processes work in various levels of our organization and what are main interfaces, even loss places of resources and whole data included in these processes and certain context. Places where we can do things and services succeeded and places which need more attention and continuous improvement.

Long-term goals and measures for these set goals must be clear and simple for everyone in organization. Automated decision-making fits very well into parts of technical assistance process because in that process it is not necessary to make any administrative decisions based on human discretionary. If customer needs formal decision in Hyrrä-online webservice, artificial intelligence can give it automatically based on requirements which were given for AI beforehand.

European Commission launched recently tool called whistleblower which is a tool to individuals for instance in public organization to announce or report violations through confidential and secured channel. This kind of tool is an example of AI Act in digital strategy of EU. Good, strategical measures should provide varied information too. There are many levels working with AI in the next ten years. On the other hand, in my conclusion is today that public sector must start searching for answers at least to following questions:

Generally, it is obvious to ask which are the future resource steps toward common public sector network into artificial intelligence?

1. What are our common tasks, targets, and common rules of AI in organization?
2. What are the risks of using AI? How do we operate and minimize risks of AI?
3. What kind of ethics are related to AI?

4. What kind of needs and targets do we already have for AI cooperation?
5. How have we set various kinds of AI positions in our work roles and tasks?
6. Who takes main facilitation position and other roles in organization AI-network?

Because there are many concerning questions about artificial intelligence and use in public sector it is needed to think about our own approach to artificial intelligence more. We do not have to know everything now, but we can go step-by-step towards AI. World is changing around us so fast technologically, economically, politically, or even socially. It is more complex to keep organization developmental strategies, tools, and investments in public sector, even if we have good processes and instructions to do our legal tasks.

DevOps is a cycle model of continuous development which is known internationally as effective model to build all kinds of software and services. This iteration model has utilized in Hyrrä-online webservice developing every day. DevOps iteration model is commonly described through continuous action (agile) process like PLAN-CODE-BUILD-TEST-RELEASE-DEPLOY-OPERATE-MONITOR. Model has been shown earlier in this research (Figure 11).

I see in my work that DevOps model gives good, active tools for software development in public sector and private enterprises. It could give something new and common discussion too. DevOps model also leans on in constant development circles regularly. DevOps model is effective to do small or bigger, short-time or long-time developments or developmental efforts by yourself and in larger team or several teams like specific IT consultant groups doing more massive digital solution platforms and using artificial intelligence into part of their work tasks.

In learning café method could be fruitful and one access to see different viewpoints of artificial intelligence. In facilitated tables participants can discuss selected themes by generated ideas. Participants continue to discuss selected themes at different café tables

UWASA - Luottamuksellinen - Confidential (3Y)

and change tables as a group when ideas are ready and written down. Finally considerable number of ideas are collected from different points of view. Method takes quite short of time (Moilanen, etc. 2022, 196).

For future orientation, it is important to compare more what kind of generative AI resources we have. Public sector organization must decide AI steps and with enormous data management model abilities and communication efforts with AI. First AI-step for us was that we got familiar with Google Copilot with basic instructions. We are going towards bigger AI steps to get more AI tools for everyday work tasks as an individual and as a team and as a public, rural implementation developmental organization division.

We need to use generative AI responsible that big computing power is minimized. Hyrräonline webservice for customers (Hyrrä AS) is meant for tool for customers when they apply support, change of support, payment application and fulfilling application data. It is important that we can evaluate our web services before releasing new versions of that for customer use.

According to Lönnqvist, A and Mettänen P., (2003, 25-26) organization has an invisible, intangible, intellectual or even knowledge assets which can be are listed: customer relationships, experiences, education, imago, knowledge and skills, processes, technologies, information systems and databases. They also explore that organization success be even better if these intangible issues are available more than physical assets like buildings, computers, production lines and money. Question is about that organization should have strategy which aims to satisfy customers' needs.

It is often reality in daily working tasks that capability to get needed knowledge just on time like AI ethical aspects could be difficult because of lack of education, resources or other investments. We need more customized AI education, knowledge, and proper measure tools to measure our information reserve with artificial intelligence. We need knowledge too to check where artificial intelligence gives us wrong information or distort

matters, things and numerical figures. It is important and needed too, that we can teach artificial intelligence, and besides that we are able to recognize what, where and when artificial intelligence is suitable for our daily work and how risks are analyzed from many levels of operational and strategical sides.

Mäki and Sorri (1999, 180) summarize, that when organization has real comprehensive quality in order, it brings competitiveness and performance like on marked terms. In organization also values and customer orientation, planned and systematic development are ways to achieve needed competitiveness. I like the idea, that management should be walk-around style instead of strict case-management. In my opinion, this kind of management fits very well AI-orientation too, because encourage forces can be in our own hands.

Our Pinja education material by Kalijärvi and Puolimatka (2024) of FFA shows that it is obvious and even necessary for good development that we can do AI-use pilots together with our customers. At the same time, we can see that finally everything new has a price, so AI network started to this collect data too how much financial AI-efforts and needed resources development requires.

In Finnish Food Authority, Rural Areas quality standards have used in distinct functions. Total Quality Management (TQM) means that organization has adopted strong will into quality management practices and has will integrate TQM-ways into organizational systems and culture. (Leseure, M. 2010, 265). We will need TQM standards increasingly in developing future software. On the other hand, lead processes according to recently published third Rural Policy Report (MMM012:00/2024).

Generative AI can create new things easily like artistic pictures. AI doesn´t give competitive advantage for us but how we could suit it, it gives us advantage AI could make us compared to our competitors. Because AI doesn´t be responsible to do suppositions or even true testing results, we need human resources to ensure that results of AI are

correct. It is visible that our food agency just needs to hire more AI experts to our organization to educate us how to use AI tools and advice to use AI effectively in weekday work tasks taking care of AI ethical and technical instructions.

Today, in continental Finland 43 % of technical assistance is rural finance from European Union and 57% is National Finnish state share. Technical assistance covers 2,5% of total CAP rural EU-finance part. CAP-technical assistance could be paid by paying agency in Finland up to 31st of December 2029. After 2029 our implementation efforts and results of job are done. Customer´s feedback shows how and what we should take under our future development processes and for further research studies toward next perennial NRP (National and Regional Action Plan) strategy 2028-2034 success and with AI.

As a researcher I would see AI process developing as a new model which will fit into expert organization like Finnish Food Authority. Process can be seen further AI research orientation process and educational themes. Developed model requires us more attention to our whole artificial intelligence performance dashboard: 1) defined goals with AI, 2) measurement set, 3) determined success factors, 4) risk management and 5) AI operating principles. At the same time staff involvement, organization informing and development of different information systems and online web services by Rural Areas Division. Determined success factors can set material or immaterial ones and factors can be the most important targets which can be measured for example by Balanced Scorecards (Lönnqvist, A. and Mettänen, P. 2003, 84-85, 90-91)

I predict that future requires knowledge which are the most useful advantages but also disadvantages of AI. It is interesting to study more about how European Union lines in Apply AI Strategy targets related to agricultural food in FFA impact when we analyze our knowledge and capability to use AI. Clear three goals by EU-law of these written lines are borrowed as follows:

- “Foster the creation of a Agri-food AI platform that will facilitate specialized farming AI-enabled tools and applications to reach the market: Q1 2027

- Devote funding for capacity building in the development of **agriculture-specific foundation models** (e.g. LLMs): Q4 2025
- Further enhance Commission's support towards the speeding up of authorizing new regulated products through AI, keeping the competitiveness of European food business operators: From Q4 2025."

According to middle goal of agricultural-specific foundation models, goal will be soon ready as well as "the speeding up of authorizing new regulated products through AI".
On the other hand, in public sector mass customers are not always familiar and their needs are not so clearly available to authorities, it is essential to collect feedback and by legislation to secure equal public services for citizens. Windrum, P. and Koch, P. (2008, 241-242) study, that there should be an understanding relationship from both sides: economic and public sector, that effective policy or many policies from different sectors can be available and both development and innovation could be implemented.

It is essential to recognize the best AI practices towards organization knowledge, capability, and continuous improvement to implement our updated strategy, and CAP-strategy by using CAP-strategy evaluations, theme interviews and surveys.

5.2.1 Trustworthiness and generalizability of the results

Today, we can trust that AI practices help us to implement our CAP-strategy step-by-step. On the other hand, we can provide development programs for future toward more specific multi-year project cases, road maps and considering AI risks management. Our AI efforts generally and especially improve in describing technical assistance as one implementing support type. In future research studies exploring and continuous improvement implementing AI-driven solutions can achieve more quality, capability, and knowledge of AI benefits.

I predict that soon new Economic Development Centre's (EDC) with their functions will have synergy effects with FFA strategical purposes and targets also with AI. With checked, correct and available data for its administrative purposes from different databases, AI

implementation steps are in significant role. Same competence and problem-solving entity in the future as well as AI orientation impacts and further discussion of AI research for Finnish Food Authority and governing bodies are needed via Finnish Collective Rural Platform.

FFA values working together in purposeful and reliable manner are very suitable values to development of AI. It is obvious, that we can do more scientifical research and research projects of AI co-operations with universities and higher education institutions in Finland, Europe and globally.

5.2.2 Practical implications

In near future AI scenario will be, that Finnish Food Authority will more focus and favor responsibilities in data protection, information security and risk management. Before that focusing, we have noticed needed AI education is needed and build generative AI use operation guides, describe process steps and technical AI protections by Digital Services. New AI tools and technologies and common AI networks will be introduced in FFA and in public sector too. Our target is to continue lean methods and continuous improvement in our digital information system development and services for customers, stakeholders and for government partners in Finland and internationally. Smart, modern and innovative technologies with AI are probable steps in the chance in public finance.

Finnish Food Authority has important role with AI because entire world seems to be in technological changing time towards artificial intelligence use with many ability tools, strategies, visions and orientation even to ethical points of views to take under serious consideration generally in public organizations in Finland and in whole European Union. According to interview of Laurila Pasi (2026) FFA AI-network leader and coordinator, we can build models for AI capability as seen in next model. Figure 16 describes situation in building capability now and from down to upper steps on how for instance data quality, metadata, and basic training of AI lead to target state of data operations and AI vision in next levels.

One more step led to data production platform, AI production platform and AI management model which opens step to utilization of AI in personal use and furthermore. It seems that future orientation in empirical issues guidelines and the research theoretical part from literature reviews is in this case research context and model of data management in FFA and some interviews natural. All previous points and understand AI use as a phenomenon to bring the basic viewpoint, present summary of AI situation and focus for this case research study.

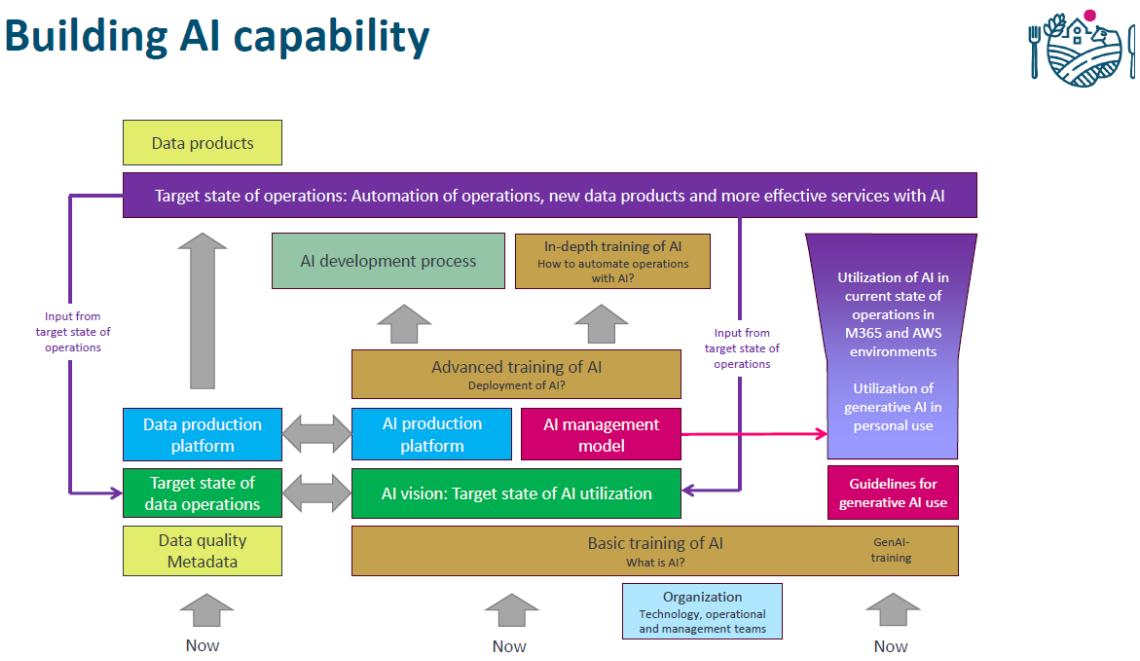

Figure 17. Building AI Capability. Laurila P. 2025. AI-network education material in Finnish Food Authority. Prikka intranet web pages.

5.2.3 Further research

Previous scenario gets support and helps from recent recommendations from OECD into our AI risk management because we are a responsible organization to implement public funds and subsidies. According to OECD classification Finland has about 95% rural areas and about 5% urban areas. This classification is in European perspective even significant theme for future rural areas policies, strategies and research in many ways.

I think with AI issues it is important to ask what, how, and who: What is the problem that needs to be solved? How can AI help in our work? And who is responsible for benefits and losses from AI use? Identifying the problem and evaluating how technology can solve these questions could be our future towards AI knowledge and capability. Whole Finland should be good place to live, rural areas should produce food, people grow, travel, and make business in rural areas. We can do everything together and use our rural areas databases wisely by AI and being conscious of the risks of being a part of AI processes.

Now we have good knowledge which is our artificial intelligence capability concerning our organization and competence, processes, data and information systems and technology. All these elements will boost us toward AI utilization capability (Figure 17). We have tools to continue work and further research with AI targets like AI vision, operations, common data or more effective services with AI for future customers and public sector partners.

Further research themes can be related to figure 17, figure 18 and figure 19 contents of CAP impacts in Finnish Food Authority and in Rural Areas (Division). All implementation processes in rural areas subsidies and technical assistance focus on information systems and AI production platforms.

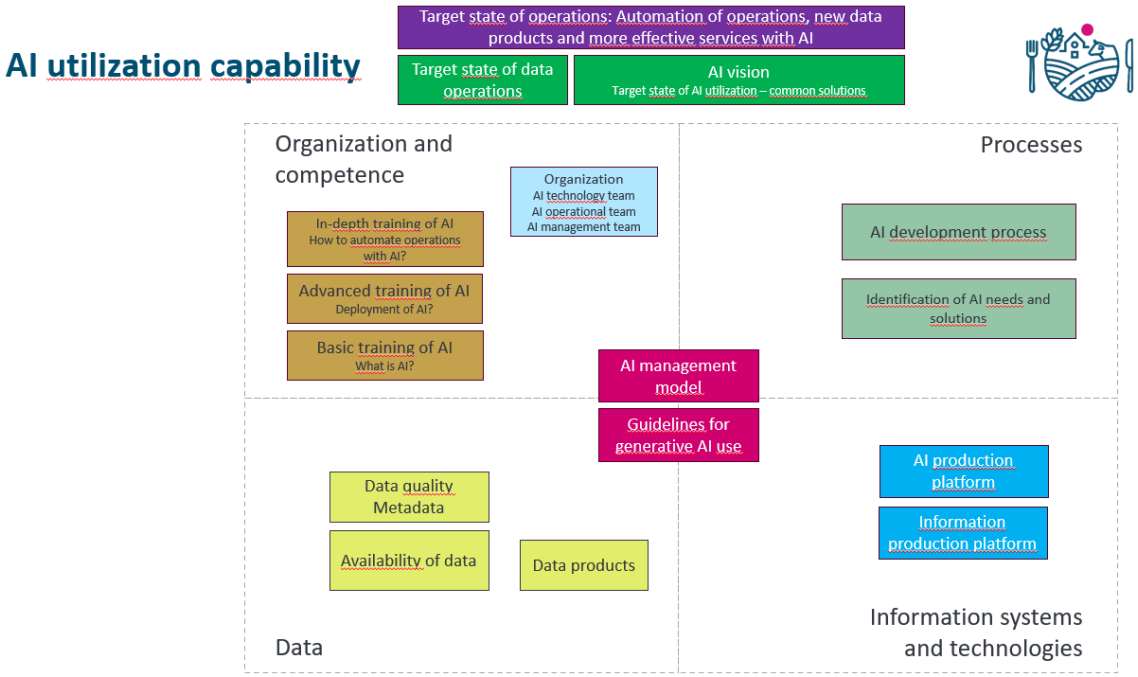

Figure 18. AI utilization capability. Laurila P. 2025. Prikka AI-network education material in FFA.

It would be great to compare AI steps and find differences between what AI impacts, knowledge and AI narratives there are in other countries, paying agencies in Europe. On the other hand, it will be interesting to study if there is common in AI utilization, activities, innovations, pursuits and roadmaps in European public sector. How each EU member state will plan their data management models towards future AI strategic steps, organize enormous databases for use of AI and add AI capabilities for administrative work tasks.

I predict that in future years our public administrative sector will put effort into reaching AI impact on chosen projects which will be funded (Figure 19). These efforts will be targeted as impacts in different eligibility like qualification for support or fund forms depending on financial framework. I assume our web-service digital processes together with customers made by continuous improvement demand capabilities, learning even more quality, enhance self-orienteering efficiency and knowledge of AI possibilities and to use AI safely and ethically.

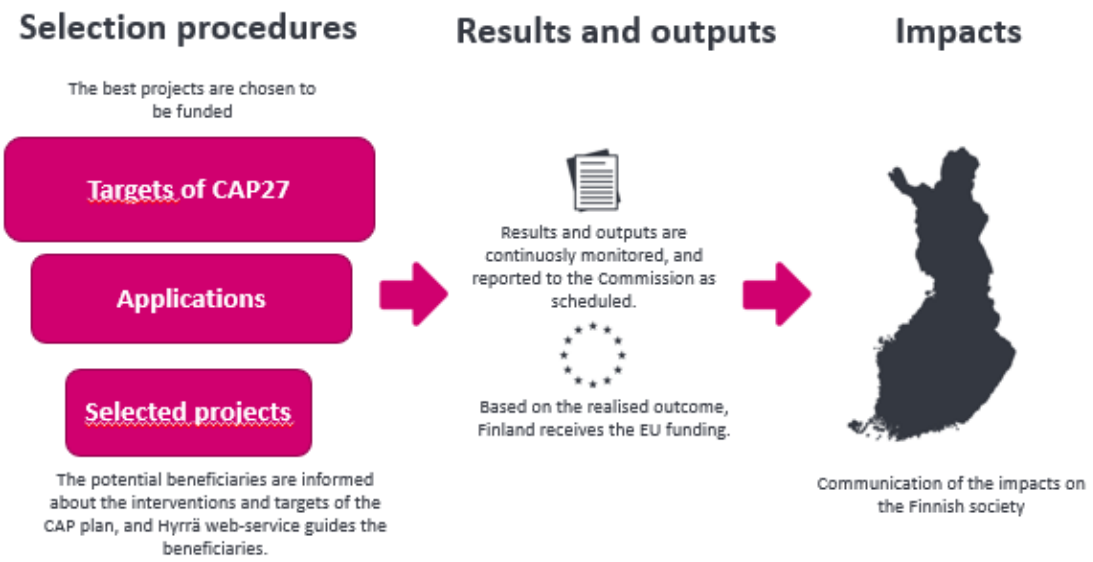

Figure 19. Finnish Food Authority. Impacts of Common Agricultural Policy (CAP). 2026. Presentation material for visitors.

Our future customers will be younger, international, “enthusiastic”, conscious of the opportunities with technology and rural area networked developers in whole Finland. Good AI practices could be shared easily through various AI networks and AI platforms. Appendices 2, 3 and 4 are for future research framework thinking and use of context planning AI which has innovative characteristics which humans have.

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Appendices

Appendix 1. Specific theme interview research questions.

A) AI objectives in organization

1. What kind of needs are there in Finnish Food Authority to use of artificial intelligence (AI) in 2023-2029?

2. How does our strategy take care of our AI-objectives?

3. How could our Enterprise Architecture (EA) and Data Management Model utilize AI?

B) AI targets in processes

4. Have you already used AI in your work tasks? If yes, what kind of experiences have you gathered?

5. What are the enablers or strengths to reach the objective?

6. Why haven't you used AI in your work tasks? What are the challenges or barriers to reaching the objective?

7. Where would you like to use AI with your team?

8. What kind of scenarios and expectations are available to use AI in your work processes for customers/stakeholders?

C) Capability and needed technological changes

9. Does Finnish Food Authority have the required maturity and capability to use AI in next years until 2029?

10. Does Finnish Food Authority have the needed technology and tools to use AI in the next years until 2029?

11. Do we have the needed maturity and capability to use AI as Authority of Rural Areas Division?

12. Do we have the needed maturity and capability to use AI in Digital Services?

D) Case study: CAP-strategy 2023-2029 in practice

13. How can AI benefit CAP-strategy implementation processes?

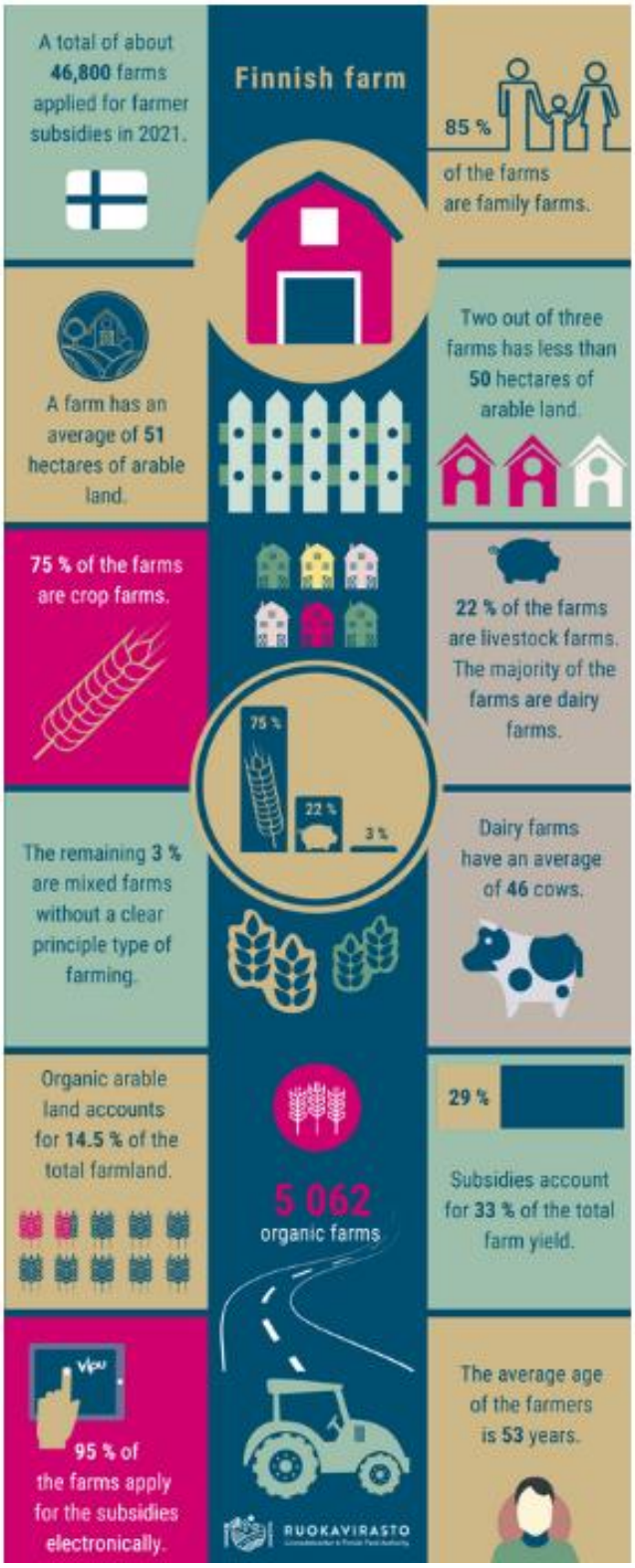
E) Future aspects

14. Any other AI recommendations, ideas and/or proposals for the future?

15. Which are your main partners/stakeholders for future AI dialogue and cooperation?

16. What are the challenges/barriers and what are the enables/strengths to reach the AI objectives in Finnish Food Authority?

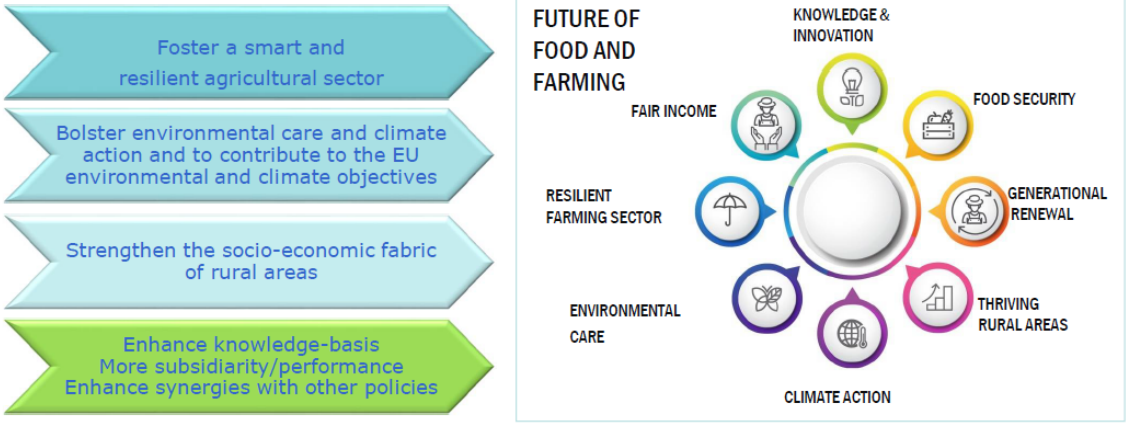
Appendix 2. Finnish Food Authority Figure of Functions. 2021.



Appendix 3. Future CAP. 2017. Ministry of Agriculture and Forestry in Finland

The Future of Food and Farming

Future CAP: Objectives and priorities of intervention



Appendix 4. Future CAP. 2017. Presentation material. Ministry of Agriculture and Forestry in Finland