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Funding Nationwide HIE and HIS: Case Kanta Services 2003–2024 in Finland

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Abstract. After the construction of the KanTa development program services by 2010, the plan was that the launched and operating services were to be funded through service user fees. However, there exist no literature on the service user fees of the Kanta Services. In this research, we utilized official documents to compile the whole of development, construction, adoption and implementation costs, and in addition, operating costs and user fees of the nationwide Kanta Services in Finland from the government perspective. The State budget was used to fund the Kanta Services' development, and funding was estimated at least EUR 415 million (including government grants) in 2003–2024. The Kanta Services' user groups were estimated to pay EUR 363 million user fees in 2012–2024.

Keywords. Kanta Services, Finland, development costs, operating costs, user fees

1. Introduction

Relevant, accurate and timely data and statistics inform stakeholders to plan, assess and adjust policies and programs and allocate resources equitably and efficiently [1]. Moving away from paper-based record keeping to digital workflows following the broad adoption of electronic health records (EHR), health information exchange (HIE) and data interoperability have become increasingly crucial components of a modern health system [2]. HIE may produce savings to organizations [3], but the value of health information systems (HIS) may not be solely expressed in economic terms [4]. Hospital and market-level barriers may affect progress in interoperability [5–7].

The theoretical construct of the Clinical Adoption Framework (CAF) provides a potential common framework for describing, measuring and comparing the adoption of EHRs by clinicians over time [8–11]. At the CAF macro-level dimension, funding alludes to the payment and remuneration, value-added (general expectations on the return-on-value from the HIS adoption) and incentives programs in place [9].

A few assessments have investigated the Kanta Services development costs in the State of Finland budget [11–15]. After the construction of the KanTa development

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program services by 2010, the plan was that the launched and operating services were to be funded through service user fees [16]. However, there exist no literature on the service user fees of the Kanta Services.

The study objective was to describe costs of development, construction and use of nationwide healthcare Kanta Services in 2011–2024 from the government perspective.

2. Material and Methods

Our study material were documents released by the Ministry of Finance (MOF) on the State budget (2011–2024) [17] and the MSAH's memorandums for the Kanta Services user fees' ministerial decrees (2017–2024).

We constructed the annual time series for relevant State budget provisions, especially budget moment 33.01.25 for social welfare and healthcare national electronic customer data systems (total moving expenses for three consecutive years) (Table 1).

Service providers and pharmacies that have joined the Kanta Services are charged user fees for the national information system services [18]. The fees cover the operating costs of producing the Social Insurance Institution of Finland's (SII) Kanta Services as well as the certification services provided by the Digital and Population Data Services Agency (Table 2). The costs are assessed in advance, and the fees are determined according to an annual estimate. The amount of the user fee is prescribed in the decree of the MSAH on the user fees for nationwide data system services in healthcare.

In the user fee annual time series, we present information by four payer groups: community pharmacies, public and private healthcare service providers and the State of Finland as a healthcare service provider. User fee collection for the Prescription Centre (PC) services started in 2012 from community pharmacies, in 2013 from public healthcare service providers and in 2014 from private healthcare service providers. User fee collection for the Patient Data Repository (PDR) services started in 2014 from public healthcare service providers and in 2015 from private healthcare service providers. Community pharmacies do not use the PDR services. The MSAH has paid the State's annual user fee (less than EUR 0.1 million) and the SII has paid an annual user fee (EUR 0.05 million) for utilization of the PC data since 2022.

All monetary values were first collected in current prices. We utilized the Finnish Consumer Price Index (CPI) values (year 2023=1.000) in 2011–2023 in order to present monetary values in year 2023 money [19].

3. Results

The State budget funded development and construction of the centralized Kanta Services at the SII. The Kanta Services' development was allocated EUR 347.78 million in 2011–2024 in year 2023 values/money (Table 1). In addition, some operative costs (EUR 18.91 million) of the SII were covered in the State budget in 2012–2014. Special projects may have covered some development costs of the Kanta Services. Altogether, at least EUR 366.69 million was allocated for development, construction, implementation and adoption of the Kanta Services in 2011–2024.

Annual State budget allocation varied by calendar year being exceptionally high (EUR 40.2–49.8 million) in 2021–2023, almost two times larger than the mean EUR 24.8 million in 2011–2024. For example in 2022, state-owned DigiFinland company returned

a vast amount of capital, a major collection of projects did not use all of its funding, and state funding was allocated to high preparedness issues. In addition, State budget allocation included excess discretionary government grants for municipalities and joint healthcare local authorities and other relevant organizations in order to prepare for the major reform of healthcare, social welfare and rescue services that took place in January 2023.

We estimate that the costs for developing the Kanta Services concept from the State budget before 2010 were approximately EUR 67.50 million in year 2023 value/money, and at least EUR 347.78 million in 2011–2024 including government grants, and thus, in total at least EUR 415 million.

Table 1. Funding of the nationwide Kanta Services in the State budget in 2011–2024 in Finland. All costs in year 2023 value/money. Source: Ministry of Finance, Finland, 2024.

State budget provision			Costs in year 2023 values												
Moment	**Explanation**		**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024***
33.01.25	**Nationwide Kanta Services**	**M€**	20,78	20,58	14,33	19,63	20,99	18,40	15,88	12,96	8,17	26,06	45,72	49,80	40,21	34,27
33.10.60 33.01.27	**Operative expenses (Kela)** **Electronic archiving (Kela)**	**M€**	0,00	1,93	10,13	6,85	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
33.03.63	**Special projects**	**M€**	9,00	12,67	9,44	9,29	9,16	6,68	9,02	7,78	5,66	12,10	8,01	7,07	6,94	8,64
All		**M€**	29,78	35,19	33,90	35,77	30,15	25,07	24,90	20,74	13,83	38,16	53,74	56,87	47,15	42,91

33.01.25 Social welfare and healthcare national electronic customer data systems (total moving expenses for 3 consecutive years)
33.10.60 Operating expenses for social protection funds of the Kela (total moving expenses for 2 consecutive years)
33.01.27 Compensation for the Kela in order to building electronic archiving and its maintenance (total moving expenses for 3 consecutive years)
33.03.63 Some special projects (total moving expenses for 3 consecutive years)

In total, payer groups were expected to pay in total EUR 179.9 million user fees in 2017–2024 (Table 2). The expected user fee amounts varied by calendar year ranging from EUR 16.91 million in 2019 to EUR 28.88 million in 2021 (in mean EUR 22.49 million in 2017–2024). The community pharmacies paid EUR 29.97 million, public healthcare providers EUR 115.03 million, private healthcare providers EUR 33.24 million and the State paid EUR 0.76 million user fees in 2017–2024.

Table 2. Funding of the nationwide Kanta Services: user fees and estimated costs by payer segments, funding recipients and data use payers in 2017–2025 in Finland. All costs in 2023 values/money. Expected user fees for year 2025 are also presented. Source: Ministry of Social Affairs and Health, Finland, 2024.

		Costs in year 2023 values								
Payer groups	**Fee, total costs**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024***	**2025**
Community pharmacies	**Fee per ePrescription, €**	0,054	0,060	0,050	0,056	0,073	0,057	0,054	0,053	0,053
	Expected number of eRx, M	60,0	60,0	62,0	62,7	67,4	68,1	68,1	76,0	76,0
	Total expected costs, M€ **	3,216	3,593	3,148	3,466	4,927	3,908	3,680	4,030	4,030
Public healthcare service providers	**Fee per inhabitant, € ***	2,272	2,513	1,964	2,554	3,356	2,665	2,509	2,965	2,715
	Number of inhabitants, M	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,6	5,6
	Total expected costs, M€ **	12,625	13,783	10,844	14,096	18,547	14,746	13,885	16,500	16,500
Private healthcare service providers ***	**Fee per ePrescription, €**	0,394	0,438	0,317	0,431	0,595	0,519	0,489	0,482	0,482
	Expected number of eRx, M	9,0	9,0	9,3	9,3	9,1	8,7	8,7	9,5	9,5
	Total expected costs, M€ **	3,573	4,005	2,915	4,012	5,410	4,519	4,225	4,580	4,580
State as a healthcare service provider	**Fee per customer, €**	-	-	-	-	-	2,509	2,509	2,965	2,715
	Expected number of customers	-	-	-	-	-	41 050	41 050	29 500	29 500
	Total expected costs, € **	0,06	0,09	0,09	0,09	0,11	0,11	0,10	0,10	0,10
**Total expected costs ** **	**M€**	**19,41**	**21,32**	**16,91**	**21,57**	**28,88**	**23,18**	**21,83**	**26,83**	**26,83**

* Originally fee per inhabitant 2.965 € but was changed to 2.715 € in September 16th, 2024 due to removal of social welfare services' user fees
** Total expected costs estimated in the previous calendar year
*** At least 90 €/year per private healthcare service provider since 2022
ePrescription = electronic prescription = eRx
M = million
- Not in use

We estimate (data not shown) that the expected operating costs of Kanta Services, and thus, total user fees were approximately EUR 183.00 million in 2012–2016, and EUR 179.9 million in 2017–2024 in year 2023 value/money. In total, payer groups were expected to pay EUR 363 million user fees since 2012 in year 2023 value/money.

4. Discussion and Conclusions

In this document based research, we compiled the whole of development, construction, adoption and implementation costs, and in addition, operating costs and user fees of the nationwide Kanta Services from the MOF's and the MSAH's official documents in Finland from the government perspective. The State budget was used to fund the Kanta Services' development and funding was estimated at least EUR 415 million (including government grants) in 2003–2024. The Kanta Services' user groups were estimated to pay in total EUR 363 million user fees in 2012–2024.

Finland's implementation and current sustainable use of the nationwide Kanta Services may have been impossible without the provision of adequate funding [11]. The MSAH financed development of the Kanta Services through annually granted State budget funds that before year 2011 were allocated in several State budget provisions. In 2011, the MSAH began to use a new State budget provision simultaneuosly to the entering into force of changes in the permanent national legislation on the Kanta Services. By introducing a single State budget provision, funding use cases and allocation to organizations (MSAH, THL and SII) became more straightforward.

Finland specifically funded and designed the electronic prescribing (PC services) to improve physicians' prescribing decisions and coordination, whereas a broader policy goal for nationwide adoption and standardization was to mitigate regional gaps in healthcare provision [20].

We assessed the development and user fee costs from the government perspective. The development and user fee costs, however, do not include costs borne by service provider organizations or community pharmacies' investments for their data systems or staff education. Furthermore, these investments are not included: mandatory certification, procurement issues, and other costs related to changing data systems or like. The government perspective does not include healthcare or pharmaceutical professionals' time spent on recording data. These inclusions and exclusion may explain why the costs estimated from the government's perspective were EUR 200 million in 2003–2014 [13] whereas costs were claimed to be EUR 400–500 million according to the National Audit Office of Finland [14]. Neither considered user fees explicitly.

The current benefits of the Kanta Services were considered significant in a recent assessment [15]. The Kanta Services were claimed to be a key digital infrastructure for healthcare, facilitating the sharing of patient data between different organizations. The transparency of funding, measures to improve practical adoption and implementation of legislation, strategic guidance and the analytical prioritization of development areas play a key role in ensuring the efficient development of the Kanta Services and their ability to future needs in the digital services development of healthcare and social welfare in Finland.

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