

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

6,400

Open access books available

174,000

International authors and editors

190M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Chapter

Challenges of Digital Tax Administration Transformation in Indonesia

Siti Kurnia Rahayu and Andri Kusdianto

Abstract

The purposes of this chapter are to identify how digital transformation can enhance the efficiency, transparency, and cost-effectiveness of tax administration, leading to increased tax revenue and reduced compliance costs in Indonesia. The results of study indicate that the digital transformation of tax administration in Indonesia is currently in the acceleration stage. The tax authority (DGT) has set a policy for digital transformation in the tax administration system to reduce compliance costs and improve administrative process efficiency, as well as optimize budgetary functions. DGT has developed big data processing from taxpayers and external parties for analysis purposes used by authorities for compliance risk management, business intelligence, surveillance, audit, and more. The challenges of digital transformation in tax administration in Indonesia are the integration of information system applications in DGT. Another challenge is the difference in interests between authorities, technological platform differences, and the willingness level of each authority toward the adoption of integrated automation processes in all sectors in Indonesia. Therefore, it is crucial to build collaboration in the development of an integrated information system and strategic adjustments to business processes. National enterprise architecture-related policies are highly needed to achieve strategic digital transformation objectives.

Keywords: digital tax administration transformation, compliance risk management, business intelligence, big data analytics

1. Introduction

Digital transformation as a series of ongoing processes in tax reform is marked by the concept of a digital transformation campaign for tax administration starting from Tax Administration 1.0, Tax Administration 2.0, and Tax Administration 3.0. Tax Administration 1.0 era where the tax administration process is done manually, then the Tax Administration 2.0 (e-administration) stage, the era of digitizing most of the tax administration processes, and then the Tax Administration 3.0 stage where the paradigm of the taxpayer and the tax administration system is interconnected, and the decision function is carried out by utilizing technology [1]. In the current era of tax administration, digital administration processes are driven by data input

from taxpayers, then analyzed to assess risks for audit purposes and other processes, which are developed gradually in stages. Digital transformation in tax administration reform is a major component in increasing capacity, efficiency, and managing big data and complex taxpayer activities with the hope that the speed and scope of tax administration will become wider and increase [2]. The digital transformation of tax administration is implemented in stages as a continuous process due to financing factors, vision, strategy, politics, and regional adoption of information system applications. Utilization of specific technologies that are implemented allows the emergence of risks and challenges that depend on several factors, including baseline, capacity, depth and breadth of technology, and infrastructure penetration. So that digital transformation in tax reform implementation must be strategically planned with a road map [3].

Digital transformation applied to tax administration in Indonesia is a series of processes that are sustainable in the long term. The Directorate General of Taxes (DGT) establishes policies to increase the efficiency and effectiveness of the tax administration process to meet the demands of tax revenues and provide services to taxpayers by utilizing data, ICT systems that are always developing dynamically, and continuous automation. Digital transformation in tax reform in Indonesia has the same goal as the main objective of digital transformation in tax administration according to ADB [2], namely to (i) increase efficiency, speed, and transparency; (ii) reduce compliance costs and tax administration costs; (iii) tax revenues increase.

The journey of tax reform in Indonesia began with the modern tax regime as a reform journey of the Tax Law starting in 1983, namely the change in the official assessment system to a self-assessment system, and in 1991–2000 with the stipulation of the basic principles of taxation and simplification of tax types. Furthermore, in 2000–2008, namely Tax Reform I as bureaucratic reform with the stipulation of the vision, missions, and blueprint in 2000–2001, and in 2002–2008 the stipulation of modernization of taxation and amendments to the Tax Law. Then Tax Reform II where in 2009–2014 a program was launched to improve internal control and in 2014–2016 as institutional transformation with institutional arrangement and management of human resources. Tax reform in Indonesia is currently entering Tax Reform III. In 2016, Bureaucratic Reform and Institutional Transformation with the Acceptance Theme Strategic Initiative were established. Then in 2017–2018 the Tax Reform Program with consolidation, accelerations, and continuity of tax reform. Furthermore, in 2018–2024 through the Renewal of the Tax Administration System (PSAP), it consists of an organization (ideal organizational structure), human resources (professional, competent, credible, and with integrity), IT and database (dependable and reliable IT and database), business process (simple, effective, efficient, accountable, IT-based, and comprehensive business processes)—Legacy and CoreTax, and laws and regulations (legal certainty, accommodating economic dynamics, reducing compliance costs, expanding the tax base and increasing tax revenue). IT and databases, as well as business processes, are embodied in the Tax Administration Core System Renewal Project (PSIAP). The Roadmap for Development of the Core Tax Administration System (SIAP) begins in 2021 and is targeted for post-implementation in 2024. SIAP Deployment is targeted for October 2023. To provide optimal benefits for tax revenues, SIAP cannot stand alone and requires the support of other institutional information systems that are realized through SIAP interoperability.

Planning, strategy, and implementation of digital transformation are linked to the larger tax agenda; therefore, it is important to utilize the *Tax Administration*

Diagnostic Assessment Tool [2]. TADAT can set the basis for reform plans, as it measures tax administration in terms of effectiveness and productivity, as well as being responsive to the needs of taxpayers [4].

Since 2016, DGT has used TADAT with an assessment focusing on 9 Performance Outcome Areas-POAs. In 2016, DGT programs included tax amnesty, TADAT self-diagnostic, formation of a tax reform team, and the Coretax strategic initiative as part of RBTK (KMK 974/2016). In 2017–2018, the establishment of a tax reform program [5], improvement of existing business processes toward Coretax, preparation of Coretax requirements and roadmaps, establishment of Presidential Decree 40 of 2018 concerning PSAP, establishment of KMK-767 concerning IS PSAP and repeal of KMK-360, improvement of existing business processes toward Coretax and preparation of KAK and RUP for PSIAP procurement. In 2019–2020 implementation of the IS work program in PSAP, reorganization of KPDJP and vertical units, Stamp Duty Law, Job Creation Law, improvement of existing business processes toward Coretax, formation of the PSIAP team and determination of selected vendors (PA, SI, PMQA, and CM). In 2021, the development of the click, call, counter (3C) system, implementation of the IS PSAP work program, improvement of existing business processes toward Coretax, system development (design, build, test, data migration), Tax Regulations Harmonization Law, self-diagnostic TADAT (per June 2021). In 2022, implementation of the Harmonization of Tax Regulations Law, implementation of a voluntary disclosure program, implementation of a carbon tax, implementation of the IS PSAP work program, improvement of business processes toward Coretax, system development (build, test, and data migration), benefit realization analysis. In 2023, regarding income tax, goods and services, Land and Building Tax, renewal of DGT SIKKA, implementation of IS PSAP work program, improvement of existing business processes toward Coretax, system development (test, data migration), PSIAP implementation (deployment), and TADAT self-diagnostic (2023). In 2024, RPP Land and Building tax rates, reorganization of KPDJP and Kanwil, reorganization of contact center and UPDDP, implementation of IS PSAP work program, and support and maintenance. Year 2025–2026 post-implementation and TADAT Self-diagnostic (2026).

DGT in utilizing information technology in tax reform, although there is an increase in the efficiency and effectiveness of tax administration, still faces challenges. Voluntary tax compliance is still a major challenge, a fully digital tax administration process does not always provide a high level of compliance. Tax gaps persist and this is a major tax challenge. Another challenge that DGT must face is the burden of compliance. Administratively fulfilling tax obligations is a burden for taxpayers and tax compliance costs for taxpayers are still high. Apart from that, in terms of verification at the end of the period due to the tax collection system. Tax audit causes a level of uncertainty for taxpayers because it has implications for cash flow management, tax debt, and taxpayer compliance costs increase in response to tax audit verification. Another challenge is that the understanding of taxation is a separate part of government administration. Differences in systems and approaches used by various government agencies in Indonesia create difficulties in data integration. This can cause problems for taxpayers because they must use multiple identities to access the online system and for tax officials in integrating taxpayer data nationally.

The increasing number of interconnections of information systems with the use of new technologies in the future will enable taxpayers to be able to use various information systems in business and in fulfilling obligations to the Indonesian government to enable voluntary tax compliance to be built naturally. DGT must be able to adapt the tax administration process to be integrated with the information system used by

taxpayers. In addition, DGT must also be able to make the tax administration process system part of the digital platform. Taxation must be integrated with other government services and functions supported by a single digital identity across all administrative services and processes nationwide.

The results of research [6] conducted a technology usage review in tax administration, covering data collection, analysis, law enforcement, and public service. However, this article has identified several gaps in their research, including the insufficient exploration of the human aspect as technology users, inadequate examination of regulatory and policy aspects, neglect of technology usage in developing countries, and insufficient discussion of comprehensive taxation system development. The study of this chapter aims to address several objectives: firstly, to examine digital transformation in tax administration reform, particularly the process in Indonesia and other countries, and identify the goals of this transformation; secondly, to explore the history of tax reform in Indonesia and how digital transformation has played a role in this journey; and finally, to provide insights into how digital transformation can enhance the efficiency, transparency, and cost-effectiveness of tax administration, leading to increased tax revenue and reduced compliance costs. The study of the chapter is a valuable addition to the existing literature on tax administration, offering valuable insights into the challenges and opportunities presented by digital transformation in the Indonesian context. It underscores the need for ongoing reform efforts to achieve effective and efficient tax administration, emphasizing the importance of digital transformation in this regard. The study notes that digital transformation is essential for increasing capacity, managing big data, and improving efficiency in tax administration. It also highlights that digital transformation is a continuous process that requires a strategic plan, considering various factors such as financing, vision, strategy, politics, and regional adoption of information system applications.

2. Method

The study of this chapter used a qualitative research approach, aiming to gain a complete understanding of the process and stages of digital transformation in tax administration reform in Indonesia. The research was designed to capture the meaning on the ground through direct interactions between the researcher and the key informants, who are the CRM and BI developers at the DGT Indonesia, as well as document analysis. The data sources were purposively selected based on their knowledge of the required data. Data collection was conducted from October 2022 to January 2023, using structured interviews and document reviews. The researcher used the triangulation method to ensure data validity, which involved comparing and verifying information from multiple sources. Data analysis was carried out using a qualitative verification strategy, which involved simplifying the data and focusing on the main research problem. The research used the DMAIC method to identify and solve problems.

3. Results and discussion

3.1 Digitization of tax administration in Indonesia

The digital transformation strategy is at the core of the national agenda to increase tax revenues in Indonesia, so it becomes the main task in establishing a balanced

digital strategy. Digital transformation is a comprehensive process that includes infrastructure, governance, business, people, and ecosystem pillars based on political, economic, social, technological, environmental, and legal analysis and circular flow models [7]. The breadth and speed of change of digital transformation are important for the government to pay attention to because it raises many public policy challenges through the development of ICT as part of the infrastructure (dependence on communication networks, big data, software, and hardware) to support policy development and implementation [8]. Digital dynamics is a challenge for policymakers in the increasingly complex field of taxation to be able to design, develop and implement policies that provide certainty and clarity and can facilitate efforts to increase tax revenues. The development of digital economic activities requires the government to be able to ensure proper tax treatment, impact the tax burden on taxpayers, and simplify the tax administration process. Voluntary tax compliance can be enhanced by digitized tax administration capabilities in providing taxpayer and third-party information in the context of cross-border access.

The tax digital transformation strategy has been stipulated in the DGT Strategic Plan and in the Road Map for the Development of the Tax Administration Core System (SIAP), which will begin in 2021. And as support for the achievement of the tax digital transformation strategy is supported by infrastructure pillars that are at the upper middle level, commitment to DGT in the development of information systems, DGT business processes and business and industrial developments, human skills and competencies as actors and Indonesian ecosystems that are influenced by political, economic, social, technological conditions, environmental, and legal analysis. Based on the Digital Transformation Index (DTI) study by Park et al. [7], Indonesia entered the accelerated stage. DTI in this study implemented three stages of digital maturity, namely foundation, adoption, and acceleration, and Indonesia obtained a DTI score of 47.19, and grade level B entered the accelerated stage.

To establish the basis for development projects, Indonesia needs to assess the stages of its digital transformation journey with reference to the “Digital Maturity” scheme developed by the Tax Administration Forum. This scheme divides the digital transformation process into Level 1, e-files; Level 2, e-accounting; Level 3, e-match; Level 4, e-audit; and Level 5, e-assess [9]. In this context, Indonesia can determine its presence on the digital maturity scale at the start of the project, plan the final goal, and determine progress according to the mapping at a certain time. Based on the index, it can be determined that Indonesia is in development on a level 3 scale, namely the development stage of sending additional accounting data from third parties and the government can access it, then matching data across all tax types and possibly all tax payments in real time. E-accounting is being developed for a pilot in 2020. Standardization of data gathering, and historical data reconciliation is still in progress. For data analysis that is currently under development are automatic generation of calculations and/or penalties, audit trails with external data, and audit trails with internal and external data both feed into the generation of outliers in the system.

Progress along the digital transformation path can also be measured by the number of budget funds provided in financing digital program planning each period. The budget commitment demonstrates the government’s commitment to implementing the transformation program and is also the basis for measuring progress [1]. The development of DGT’s Core Tax System ecosystem infrastructure requires funds of IDR 44.01 trillion and has been approved by the DPR as the Indonesian legislative body for the 2022 fiscal year. The Indonesian government’s commitment to the digital transformation journey is demonstrated by this funding and approval by the DPR.

With an assessment of these indicators, the journey of digital transformation in Indonesia can support tax reform in accordance with its objectives. Digitalization that has been applied to tax administration in Indonesia has covered every function of tax administration operations.

DGT has responded well to the dynamics of changes in the ICT landscape in the development of digitization of tax administration in Indonesia. Technological waves that have an impact on digital tax administration are basic, consolidated, and optimal [1]. The tax authorities in Indonesia have gone beyond the initial wave of ensuring that tax information has been digitized (analog process to digital process). The implementation of e-filing for taxpayers has been implemented properly and provides DGT with accurate data in verifying taxpayer reporting. The consolidation wave was characterized by a rapid evolution of new ICT applications [1]. DGT uses basic analysis, data warehouse, and new information sources related to taxpayers through policies in the form of data handling rules that can enable process automation. Improvement in the efficiency and speed of the tax administration process in Indonesia occurred in this wave and this is the final point because it can reduce compliance and tax administration costs as well as smooth data flow but cannot fully automatically support the tax audit process. The third wave, namely optimization, shows a significant shift in control and managerial elements. Tax administration will be able to control the design of information flow and optimize data flow. Predictive analytics, machine learning, and deep neural networks can enable computers to optimize systems [1]. DGT has designed and developed an information system on this element with the use of technology while it is important to control the technology used. This shift in managerial terms indicates the heads and managers of the tax authority to plan the goals and operations of the tax authority where the machine can optimize the data for decision-making [1]. DGT has not fully experienced this significant shift, because the implementation of advanced technology has not been equipped with blockchain technology or AI technology. DGT also has not fully integrated DGT software into other organizational systems in capturing tax-related transactions in real time. This is a challenge for DGT to define a new approach in digital tax management in the future.

The Indonesian tax authority (DGT) continues to make progress with the use of modern technology in most aspects of tax administration, increasing efficiency and service standards to taxpayers. Core IT systems (Core Tax Systems) are developed in-house, by developers, or through a combination of both, custom-developed and using commercial off-the-shelf packages [1]. Core Information Technology Systems is specially developed by developing a series of programs into a system by internal or external experts, where skilled and comprehensive analysis, design, and development teams are obtained from external parties. This process uses the traditional “waterfall approach,” which requires detailed design confirmation prior to system construction and requires a level of knowledge of the ideal future system and procedure. Teams can develop new systems that are adapted extensively to defined business needs [10]. DGT continues to focus on developing a strong information system for the core functions of the tax administration process, using in-house system development. Development of Core Information Technology Systems in Indonesia since 2018 using solutions developed in-house.

Tax administration is an important process in producing tax information for decision-making. Processes in tax administration include taxpayer registration, tax payment, tax reporting, tax audit, and collection that are built systematically and comprehensively. The large and complex volume of data related to the tax

administration process that must be managed by DGT requires a comprehensive and well-integrated information technology infrastructure and information system. The challenge for DGT is to develop *Core Information Technology Systems* to be able to realize effective and efficient tax administration.

Indonesia's tax digitalization journey began in 2001, with the view that modernization and digitization are the keys to increasing voluntary taxpayer compliance. 2001–2008 was a period of digitalization of DGT business processes, such as SPT payment and reporting, as part of the tax base expansion program. 2009–2016 was a period of expanding efforts to digitize taxpayers and the initial steps of digitizing internal business processes such as data analysis. 2017–2024 is the period for delivering IT systems to manage all administrative processes (Core Tax System) to support fundamental transformations in tax administration and to transform back-end digitization efforts.

The tax administration in Indonesia started the digitization process by automating the basic functions of electronic registration and filing and is on the way to digital transformation to enable real-time transaction data to flow into the online tax administration system. In 2011, the e-registration system was implemented. E-registration with tax authorities integrated within the electronic process of starting a business through other government ministries in 2013, has been able to support the effectiveness of management of tax reporting and payment records in tax audit trails and changes in taxpayer information as well as supporting online access to initial registration and updating of details. This element in the digital journey, once functional, is a major step toward a seamless and continuous flow of data that will increase compliance rates and significantly lower compliance and administration costs.

Increasing the availability of data that has been analyzed is able to direct the implementation of the operational process of tax administration in Indonesia in services for taxpayers that facilitate understanding and reporting of tax obligations. It is also possible to encourage changes in taxpayer behavior toward voluntary compliance. Providing independent services for taxpayers in the form of *e-filing*, *e-billing*, *e-SPT*, and others through the introduction of a web-based mobile application as DGT's effort to provide an easy communication channel for taxpayers. This has shown a shift in the design of most of the tax administration processes in Indonesia toward a user-centered design even though it has not been fully integrated into e-government initiatives with limitations on the protection and security of taxpayer data. DGT's era I tax reform was the beginning of a tax technology revolution where DGT focused on *e-filing* to ensure accuracy and as a first step in digitizing data. The main timeline of DGT's digitization journey related to taxpayer services began with the launch of an electronic payment application (MP3) in 2002. In 2004, e-Filing of the annual income tax return through a third-party Application Service Provider (ASP). Then in 2008 the online and chat Kring Tax was launched to answer taxpayer questions. Furthermore, in 2012 further development for e-Filing of the Annual PPh SPT through the DGT website was launched. E-billing, which facilitates electronic tax payments by generating a 15 digits ID billing code for tax payments, was implemented in 2013. In 2014, DGT created the DGT Online website for submitting SPT and e-Invoice Tax (E-Faktur Tax, FP) for Pilot VAT. In 2016, the e-Billing application is required to be used by taxpayers and e-Tax Faktur (e-Tax Faktur, FP) for VAT. Electronic Tax Withholding Proof (E-Bupot) for 2017 PPh deductions. During this period DGT started experimenting with using third-party data to be able to monitor taxpayer compliance.

Increased use of data from third parties available for use by DGT coupled with advances in data analysis with analytical techniques according to the needs of tax

administration. Information can be used as a source of verification of taxpayer tax reporting and payments and can minimize the tax compliance burden due to the use of ICT (*compliance by design*). The information system that has been built by DGT can support tax reporting verification activities, including the operation of assessing tax reporting and payment, tax audits, tax collection, and tax investigations. DGT has developed a risk management system so that audit selection is centered on using analytical results to select the highest-risk cases. The extension of the assessment and auditing techniques implemented by DGT required matching, filtering, and storing data and then the use of predictive technologies (and machine learning technologies), which can perform risk assessment operations using a variety of sources and formats.

3.2 Technology used by DGT

DGT has adopted ICT with updates that are tailored to the needs and used in the tax administration process that has supported all stages of the tax administration operational cycle. DGT adopting ICT is intended to achieve the goal of reducing compliance costs to increase tax compliance. The use of *e-faktur* in Indonesia and the use of data matching technology on transaction invoices have been able to detect the possibility of fictitious invoices to increase VAT collection. Indonesian tax authorities have started to collect digital invoice data, although it is not optimal.

The technology used in developing administrative information systems and taxation ICT operational solutions in Indonesia, DGT uses a custom built, commercial off the Shelf, and software as a service (cloud-based) approach. The use of innovative technology in the form of Cloud Technology has been implemented in the development of tax administration, while DLT/Blockchain and Artificial Intelligence have not been used. As for the use of innovative technology in the form of Data Science/ Analytic Tools, Application Programming Interfaces (APIs) have been implemented. DGT has not used Robotics Process Automation, Whole of Government Identification Systems, Digital Identification Technology (e.g., Voice), and Virtual Assistants.

DGT has also utilized the types of electronic services provided for taxpayers in the form of information on the website, tools, and calculators on the website, access to integration of taxpayer accounts, online services (e-filing), electronic invoicing systems for businesses, access to taxpayer data from third parties, and digital mailboxes. DGT offers a website with general tax-related information, which is quite complete and easy to navigate. DGT offers tools and calculators for use by taxpayers. DGT has an integrated system of taxpayer accounts that can show the entirety of taxpayers, most of which benefit businesses that usually have tax-related responsibilities. DGT provides services that enable taxpayers to make online tax transactions. DGT provides an electronic tax collection system to support DGT business processes. DGT can also obtain taxpayer information from third parties. DGT has provided modern and comprehensive electronic services for taxpayers.

3.3 Considerations for the development of tax administration

Dynamic technological developments have given the tax administration process the opportunity to re-evaluate not only how the tax authorities can carry out their functions but also what functions are still needed and what new activities can be carried out in achieving tax administration goals. The use of innovative technology in tax administration focuses on retrieving, decoding, and executing data that can be useful in assisting existing tax administration functions. The main target is to increase the

available data sources and enable matching of these data sources with taxpayer data [1]. The resulting key processes include (i) digital data collection; (ii) tax governance framework; (iii) Extended application of advanced analytics; (iv) utilization of online taxpayer services [1].

In Indonesia, tax administration focuses on *e-filing* and gathering digital financial reporting information. DGT has also begun to base its allocation of scarce resources on risk management principles to achieve higher levels of tax compliance. Data analysis is currently used by the tax administration in Indonesia mostly for tax audit case selection and non-compliance detection. Tax administrations are starting to implement techniques that identify potentially risky taxpayers or returns. Digital analytical processes are also used in several tax administration functions and activities; thus the use of advanced analytics will be further expanded. DGT has also made efforts to increase the use of online services for taxpayers. Providing taxpayers with a single platform and/or online tax application by DGT in the *e-billing application* can lower costs and provide a better understanding for taxpayers.

DGT's focus to date has been on automating current processes and increasing their scope and efficiency. Indonesia's tax administration process in the future will develop better, involving process rethinking and digital infrastructure reimagining to achieve goals. Technological innovations enable changes in tax administration and result in the need to reconsider options in tax administration, which are already embedded in the tax regime, by not being included in future designs. This requires a clear vision of the goal of tax administration in the long term. The tax administration will eventually include elements of the tax ecosystem that are connected to each other due to digitalization in all fields. Data collection is an important part of the verification function, embedding taxes into natural systems can help simplify the data collection process with the effectiveness of validating data checks. In addition, data collection does not only come from taxpayer reports but can be in the form of transferring data into the taxpayer's natural system by relying on intermediaries or third parties. With big data that can be analyzed properly, tax administration can become a data-based tax audit. Tax risk can be managed properly so that taxpayer behavior can change toward voluntary compliance and increased control of tax payments. Data security, data management, and data governance have become key for future tax authorities. Complexity increases as data sources increase, along with the complexity of the data management system.

3.4 Risk management in tax digital transformation

The tax administration function that can run according to its vision requires careful planning and effective implementation, where development projects are built based on digital transformation goals and require major changes with parallel distribution to reduce risk [1]. Issues that have the potential to become risks can be identified in the transformation of tax administration in Indonesia including: (i) a comprehensive digital strategy; (ii) innovative resources, infrastructure, and designs; (iii) the adoption rate of e-filing and data analysis and process automation; (iv) exchange of data with other bodies; (v) appropriate change management and enabling administrative processes. While the general risks in digitalization that every tax administration faces [11] are to help tax authorities reduce the risk of (i) inheritance systems. It is necessary to input data from the old system into the new system; (ii) complexity. Simple system design can create a reliable digital equivalent; (iii) limitations of the digital system. A system must be designed to ensure data is not

missed in the automatic data flow; (iv) security and privacy. There must be regulations for the protection of the security of taxpayer data; (v) costs incurred in developing digitization; (vi) audit systems development that focuses on a technology-neutral approach; (vii) political risk. Political support is needed in developing the project.

The approach to addressing these risks [12] includes (i) careful planning in a technology road map; (ii) an operating model that supports the technology and enables long-term application in decision making; (iii) design of technology initiatives in building a technology road map through an assessment with the right methodology; (iv) design of interventions that pay attention to internal and external change management in the initial engagement of key stakeholders as management support; (v) HR management that is in line with the implementation of the technology road map; (vi) Manage expectations on digital initiatives such as clear return on investment; (vii) actual learning to make decisions in advanced planning.

DGT applies the Enterprise Risk Management (ERM) framework in providing a methodological structure for tax compliance risk management (CRM) using the ISO 31000:2018 risk management approach. Taxpayer compliance risk is all *likelihood* or uncertainty *that* can have *consequences* on the main target of the tax authority, namely optimal tax revenue [13]. In implementing DGT's compliance risk management, it utilizes innovative technology which is implemented in stages in the framework of digital innovation testing. DGT also has broad autonomy in managing HR qualifications. DGT has a formal organizational unit to encourage innovation in the development of risk management systems, namely the Directorate of Technology and Information, and the Directorate of Information and Communication Technology Transformation.

DGT works closely with private sector collaborators on a user-centric approach to designing digital tax systems. DGT focuses its approach to technology development on taxpayers to encourage the use and help users maximize the benefits of this technology. DGT has partnered well with the private sector to reduce development costs. Since 2005, third-party ASPs have been able to facilitate the submission of corporate income tax returns electronically. Currently, eight ASPs are available to all taxpayers. ASP adds value by integrating various digital services provided by DGT into one platform and enabling a more user-friendly experience. DGT's transformation to the point where a new approach is optimized has become a long and gradual process of building systematic capabilities. The adoption of a technology approach should always be driven by level of capability, business needs, and priorities, not just data and technology availability.

In implementing risk management at DGT, three things need to be developed, namely, risk culture, system and structure, and the whole framework. Risk management at DGT consists of taxpayer risk management which is Client risk (Third Party) from the point of view of the company and institutional risks related to strategic risk, operational risk, HR risk, financial risk, budget risk, and others. The two cannot be separated in terms of DGT's efforts to treat taxpayers and qualified human resources according to the required placement.

The Industrial Revolution 4.0 ushered in the development of Big Data Analytics at DGT, where organizational efficiency is achieved using technology-based smart assistance systems that can replace routine tasks to be able to focus on creative and valuable activities for employees [14]. The development of BDA at DGT began in 2014 through the development of a Compliance Risk Management (CRM) risk machine to increase taxpayer compliance, and at the same time to fulfill the performance indicators of the Tax Administration Diagnostic Assessment Tool Field Guide (TADAT),

specifically on POA 2 (Effective Risk Management), namely The DGT is declared to have implemented ERM if the DGT is able to manage all tax risks effectively. DGT's risk management has been regulated in the Director General of Tax Decree Number KEP-702/PJ/2019 concerning risk management within the Directorate General of Taxes which mostly regulates institutional risk management.

DGT has developed BDA starting by utilizing internal data and external data. Data warehouse is a place to collect data, processed and analyzed by data scientists. Infrastructure support that is specifically managed by the Directorate of Information and Communication Technology (ICT) is a supporting facility related to storage servers and the provision of applications. The BDA implementation process at DGT is divided into several parts starting from analytical activities which include determining the context, identifying risks and/or variables, exploring data, modeling, mockup user interfaces, deployment, monitoring, and evaluation. Furthermore, the analytical methods and techniques used are Data Matching, Natural Language Processing (NLP), Classification, Clustering, Social Network Analysis (SNA), and Graph Data Science which produce products such as CRM, Smart web, and ATP. BDA at DGT was developed by the Directorate of Tax Data and Information (DIP) with duties and functions covering data governance and management, individual analysis, and CRM & BI development.

DGT has used a solution approach in ICT development and operations: custom-built, commercial off-the-shelf, and software as a service (cloud-based). While status with Use of Innovative Technologies includes the implementation of Cloud Technology, and for DLT/Blockchain and Artificial Intelligence it has not been implemented. DGT implements Data science/Analytics tools and implements Application Programming Interfaces-API. For RPA, Whole Government Identification Systems, Digital Identification Technology, and Virtual Assistants are not used in system infrastructure development.

CRM is a structured process for the systematic identification, assessment, rating, and treatment of taxpayer compliance risks [15]. The development of CRM as a risk *framework* managed by DGT began in 2004 [16], and the development of CRM-based taxpayer compliance began in 2005 through the establishment of a taxpayer monitoring mechanism by an account representative (AR). In 2008, AR was equipped with a Web-Based Taxpayer Profile Application (Approweb) as a tool to carry out the supervisory function in mapping taxpayers' potential activities. The development of CRM in 2012 was marked by an increase in the quality of *Total Benchmarking*, namely the *Behavioral Benchmarking Model* (BBM) (SE-40/PJ/2012). BBM is one of the tools to explore potential taxpayers by mapping the risk of non-compliance by corporate taxpayers. In addition, DGT has implemented CRM in the billing function based on *aging*.

The development of comprehensive risk-based taxpayer compliance (CRM) began to be developed in 2013. CRM became one of the sixteen DGT institutional transformation strategic programs with assistance from McKinsey as a consultant. CRM developments that have been carried out by DGT: (i) In 2019 implemented: (a) CRM Extensification Function (aimed at providing a compliance risk map in the taxpayer registration process), (b) CRM Inspection and Supervision Function (aimed at mapping taxpayers and giving priority to taxpayers taxes to be supervised or audited), and (c) CRM Billing Function (aimed at increasing the effectiveness and efficiency of disbursing tax arrears); (ii) In 2021 DGT has implemented CRM, namely (a) CRM Tax Education Function (aimed at determining a list of extension targets), (b) CRM Transfer Pricing (producing a map that illustrates taxpayer compliance in applying the principles of fairness and customary business for transactions involving

influenced by special relations and other international tax transactions); (iii) In 2022 DGT implements: (a) CRM Law Enforcement Function (aimed at providing early warning detection of indications of tax crime), (b) CRM Appraisal Function (aimed at optimizing the role of assessment in order to increase taxpayer compliance), (c) CRM Service Function supports voluntary compliance by providing nudging notifications using a different language according to the risk profile of the taxpayer. The use of language in notifications adopts the behavioral insight. (d) The CRM Objection Function aims to allocate objection files based on the competence and workload of the Objection Reviewers so that the objection process can be made shorter; (e) CRM Integration, linking 11 DGT business processes, and using the Integrated Compliance Approach concept, (an approach to assessing tax compliance as a whole from taxpayers; (v) In 2024, DGT will integrate several BI in CRM Integration, so that DGT's vision is Data-Driven Organization (DDO) achieved.

CRM processes are aligned with the Data-Driven Organization model. The availability of consolidated master data generated through data management and data governance supported by adequate analytics capabilities is a key factor in determining the success of the CRM process, especially at the risk identification, risk analysis, and risk evaluation stages. CRM is formed by relying on processed data so that it can form a map of taxpayer compliance and provide input on the appropriate treatment for each taxpayer's risk position as a prescriptive analysis from a data analytics point of view.

Digital transformation at DGT in the future will lead to a natural digital system. In this concept, the tax administration system is integrated with the daily economic activities of taxpayers, and taxpayer data is automatically stored in DGT's data storage. The natural digital system products include e-Reg, Online NPWP validation, e-Faktur, e-Bupot 23/26, e-Bupot Unification, e-Billing, and improvements to e-Filing. The implementation of natural digital systems can also be seen in the development of the Extensible Business Reporting Language (XBRL) for submitting electronic-based financial reports. With the implementation of natural digital systems, taxpayer activities can be detected from the start to minimize the possibility of non-compliance and taxpayer fraud. Starting with the launch of e-Filing, the development of BDA at DGT is expected to lead to the implementation of natural digital systems that are integrated with CRM.

Development of Business Intelligence (BI) at DGT is carried out based on the Data Management Body of Knowledge (DMBOK) namely data governance design guidelines at DGT, which consists of the areas of Data Architecture, Data Modeling and Design, Master Data and Reference, Data Storage and Operations, Integration and Interoperability, Enterprise Data Warehouse and Business Intelligence, Documents and Content, Metadata, Data Security, and Data Quality.

Business Intelligence used by DGT is a process in DGT's efforts to add value to data and insights used in decision-making. Types of Business Intelligence in the form of descriptive analytics that have been produced by DGT are "Acceptance Dashboard" and "Smartboard". Descriptive analytics is a form of analytics and reporting on historical data. Meanwhile, the type of Predictive Analytics that has been implemented by DGT is "Ability to Pay", namely BI which can predict the ability of taxpayers to pay taxes. Predictive analytics uses machine learning technology, algorithms, and Artificial Intelligence. The BI type of prescriptive analytics implemented in DGT is a CRM risk engine.

BI development at DGT applies the Cross-Industry Standard Process for Data Mining (CRISP-DM) approach. This model was developed by a consortium consisting of NCR System s Engineering Copenhagen, DaimlerChrysler AG, SPSS Inc., and

OHRA Verzekeringen en Bank Group. BI developments that have been carried out by DGT: (i) In 2021, DGT has implemented Business Intelligence, namely (a) Smart Web (a data visualization in graphical form that aims to identify beneficial owners and group members of a group company and also visualize related transactions whether reported in the notification letter (SPT) or not), (b) Ability to Pay (aimed at predicting the ability to pay off the taxpayer), (c) Middle WP Dashboard (aimed at monitoring taxpayers to be more effective and efficient), (d) Smartboard (aimed at assisting in monitoring and prioritizing supervisory follow-up in the remaining time of the year and determining strategies for achieving revenue based on the potential of each work unit); (ii) In 2022 DGT will implement 8 Business Intelligence products for reception and human resources (HR). Business Intelligence is one of the supporters of CRM Integration implementation. (iii) In 2023, DGT develops (a) Reception BI, (b) HR BI, (c) organization BI, (d) Regulation BI.

3.5 Tax digital transformation challenges

Implement *Compliance Risk Management* and *Business Intelligence* in responding to the challenges of BDA development, by establishing CRM and BI in 2023 to become DGT's backbone to increase voluntary taxpayer compliance. The challenge faced by DGT in this regard is to ensure that all business processes can be integrated and structured with each other. SIAP Update (PSIAP) as a DGT program is heavily influenced by the readiness of CRM and BI in processing data and visualizing it into valuable information in each advanced business process such as extensification, monitoring and auditing, billing, law enforcement, service, objection, appraisal, and international taxation.

The challenges faced by DGT in implementing integrated CRM are data quality and model maturity. Data quality is still a challenge for CRM development. Infrastructure is DGT's challenge in CRM development with the start of using national data. The volume, breadth, and complexity of data require adjustments in infrastructure capacity to be able to keep up with data capacity in CRM development.

Another challenge faced by DGT is the current CRM development process, which is the loss of qualified human resources due to mutation/promotion by bringing their CRM knowledge, thus requiring the recruitment of new human resources to be retrained. With *technical assistance* from AIPEG and ATO (Australian Tax Office) assisting DGT in continuing development. DGT's CRM team was formed to address HR issues due to the characteristics of the task force which were still not solid. The establishment of the Taxpayer Compliance Risk and Data Science Sub-Directorate (RKWPSD) under the DIP Directorate as DGT's data support directorate, is DGT's effort to apply international *best practice* in CRM development. The DIP Directorate must be able to meet the needs and manage the expectations of stakeholders to maintain *user engagement* with the products it produces. DIP is preparing a CRM, BI, and TAM (Taxpayer Account Management) "home" when the *Core Tax Administration System* (CTAS) has been implemented. Adequate capacity of a special dedicated unit as a CTAS manager needs to be prepared.

The challenge of implementing CRM is a matter of adaptation to the risk culture by vertical units. Future business process designs that require the use of CRM/BI/Taxpayer Account Management (TAM) as a starting point for supervisory actions may be hampered by possible resistance from field staff. DGT implements change management and coercion programs to overcome resistance to this cultural change. DGT has issued a policy that "forces" vertical units to do things according to CRM's

directions. This policy is expected to prevent the election of supervised taxpayers based on the subjective considerations of Account Representatives but with elections originating from machine scoring.

DGT's vision and urgency to become a Data-Driven Organization is pursued through various programs related to data collection, management, and utilization. The data managed is internal data originating from the registration, payment, and reporting functions of taxpayer SPTs, which need to be managed according to Data Governance principles so that they can be used optimally. External data was obtained from Agencies, Institutions, Associations, and other parties (ILAP). The right data in accordance with the actual situation (guaranteed single source of truth) and data needs that can be fulfilled through the integration of data exchange between DGT and ILAP are important. DGT has started to build an Evidence and Information System (IBK), which can directly connect DGT with data providers. The challenge is the readiness of the data provider. Currently, what has been initiated in cooperation with several banking companies. DGT is currently piloting a host-to-host integrated system with State-Owned Enterprises (BUMN). Pertamina, Indonesia's state-owned oil and gas company, 2018 provided DGT with real-time access to its information systems, including data on purchases and sales, payroll, and transactions with third parties. State-owned electricity distribution company PLN and PT Telekomunikasi Indonesia followed suit.

The reliability of BDA results is strongly influenced by quality internal data and external data and in accordance with the rules of Data Governance. The role of data governance in improving CRM and BI at DGT: (i) setting the roles involved, which consist of data governance in identifying and defining, the person in charge of each process of data management, escalation, and resolution of problems related to data; (ii) process arrangements related to data management to ensure data is collected, stored, accessed, and processed in accordance with the rules and best practices; (iii) regulating the flow and formation of data, and ensuring the availability and formation of data are in accordance with the needs of CRM and BI development; (iv) technology-related arrangements in accordance with the needs and capabilities of the organization. A data warehouse is needed that can guarantee a single source of truth for all data flows between units.

Most organizations, including organizations in the government sector, understand that if all the data in their business processes can be integrated, then the organization can apply BDA to increase the added value of the organization and obtain significant information including feedback as material for BDA improvement. The challenges in system integration with other authorities in Indonesia are differences in interests between authorities, differences in technology platforms, and the level of willingness of each authority to adopt integrated automation processes in all sectors in Indonesia. It is very important to build collaboration in the development of integrated information systems and strategic adjustments to business processes. Policies related to national enterprise architecture are urgently needed to achieve digital transformation strategic goals.

4. Conclusions

The digital transformation strategy is at the heart of the national agenda to increase tax revenues in Indonesia, which has been stipulated in the DGT Strategic Plan and in the Road Map for the Development of the Tax Administration Core

System (SIAP) which will begin in 2021. Based on the 'Digital Maturity' Index scheme developed by the Tax Administration Forum, it can be determined that Indonesia is in development at a level 3 scale, namely the 2020 E-accounting development stage. Standardization of data gathering and historical data reconciliation are still in progress. For data analysis that is currently under development are Automatic generation of calculations and/or penalties, audit trails with external data, and audit trails with internal and external data both feed into the generation of outliers in the system.

Indonesia's tax digitization journey began in 2001. 2001–2008 was the period of DGT's business process digitization. 2009–2016 was a period of expanding efforts to digitize taxpayers and the initial steps of digitizing internal business processes. 2017–2024 is the period for delivering IT systems to manage all administrative processes (Core Tax System) to support fundamental transformations in tax administration and to transform back-end digitization efforts. The development of DGT's Core Information Technology Systems has been carried out since 2018 using solutions developed in-house.

The technology used in developing administrative information systems and taxation ICT operational solutions in Indonesia, DGT uses a Custom Built, Commercial Off the Shelf and Software as a service (cloud-based) approach. The use of innovative technology in the form of Cloud Technology has been implemented in the development of tax administration, while DLT/Blockchain and Artificial Intelligence have not been used. As for the use of innovative technology in the form of Data Science/Analytic Tools, Application Programming Interfaces (APIs) have been implemented. DGT has not used Robotics Process Automation, Whole of Government Identification Systems, Digital Identification Technology (e.g., Voice), and Virtual Assistants. DGT has also utilized the types of electronic services provided for taxpayers in the form of information on the website, tools, and calculators on the website, access to integration of taxpayer accounts, online services (e-filing), electronic invoicing systems for businesses, access to taxpayer data from third parties, and digital mailboxes.

DGT applies the Enterprise Risk Management (ERM) framework in providing a methodological structure for tax compliance risk management (CRM) using the ISO 31000:2018 risk management approach. The development of BDA at DGT began in 2014 through the development of a Compliance Risk Management (CRM) risk machine to increase taxpayer compliance, and at the same time to fulfill the performance indicators of the Tax Administration Diagnostic Assessment Tool Field Guide (TADAT), specifically on POA 2 (Effective Risk Management). DGT has developed BDA starting by utilizing internal data and external data. Data warehouse is a place to collect data, processed and analyzed by data scientists. Infrastructure support is specifically managed by the Directorate of Information and Communication Technology (ICT). BDA implementation at DGT is divided into several parts starting from analytical activities which include determining the context, identifying risks and/or variables, exploring data, modeling, mockup user interfaces, deployment, monitoring, and evaluation. Furthermore, the analytical methods and techniques used are Data Matching, Natural Language Processing (NLP), Classification, Clustering, Social Network Analysis (SNA), and Graph Data Science which produce products such as CRM, Smartweb, and ATP.

DGT has used a solution approach in ICT development and operations: custom-built, commercial off-the-shelf, and software as a service (cloud-based). While status with Use of Innovative Technologies includes the implementation of Cloud Technology, and for DLT/Blockchain and Artificial Intelligence it has not been implemented. DGT implements Data science/Analytics tools and implements Application

Programming Interfaces-API. For RPA, Whole of Government Identification Systems, Digital Identification Technology, and Virtual Assistants are not used in system infrastructure development. CRM developments that have been carried out by DGT from 2019 to 2022 include CRM Extensification Function, CRM Inspection and Supervision Function, CRM Billing Function, CRM Education Taxation Function, CRM Transfer Pricing, CRM Law Enforcement Function, CRM Appraisal Function, CRM Service Function, CRM Function Objection, and CRM Integration, connecting 11 DGT business processes, and using the Integrated Compliance Approach concept. The development of Business Intelligence (BI) at DGT is based on the Data Management Body of Knowledge (DMBOK). BI developments that have been carried out by DGT from 2021 to 2023 include SmartWeb, Ability to Pay, Intermediate WP Dashboard, Smartboard, BI Acceptance BI, HR BI, organization BI, and Regulation BI.

The challenge faced by DGT in this regard is to ensure that all business processes can be integrated and structured with each other. Data quality is still a challenge for CRM development. Infrastructure is DGT's challenge in CRM development with the start of using national data. The volume, breadth, and complexity of data require adjustments in infrastructure capacity to be able to keep up with data capacity in CRM development. Another challenge is the current CRM development process, which is the loss of qualified human resources due to mutation/promotion by bringing their CRM knowledge, thus requiring the recruitment of new human resources to be retrained. In addition, there are issues related to adaptation to the risk culture by vertical units. Future business process designs that require the use of CRM/BI/Taxpayer Account Management (TAM) as a starting point for supervisory actions may be hampered by possible resistance from field staff. The reliability of BDA results is strongly influenced by quality internal data and external data and in accordance with the rules of Data Governance. A data warehouse is needed that can guarantee a single source of truth for all data flows between units. The challenges in system integration with other authorities in Indonesia are differences in interests between authorities, differences in technology platforms, and the level of willingness of each authority to adopt integrated automation processes in all sectors in Indonesia. It is very important to build collaboration in the development of integrated information systems and strategic adjustments to business processes. Policies related to national enterprise architecture are urgently needed to achieve digital transformation strategic goals.

5. The limits of the study and the further research

The study has limitations in examining digital transformation in taxation administration while considering the roadmap of taxation reform in Indonesia, with a focus on Tax Reform III and the Taxation Administration System Renewal (from 2018 to 2024) and considering the specific risks and challenges of utilizing information technology.

Further research based on this study could include (1) digital maturity analysis to assess the performance of the Indonesian tax authority in implementing IT in taxation administration; (2) evaluation of digital transformation success to evaluate the success of digital transformation in taxation administration in Indonesia; and (3) risk analysis and risk management to analyze the effectiveness of risk management systems implemented in the Directorate General of Taxes (DJP), particularly in terms of tax compliance.

IntechOpen

Author details


Siti Kurnia Rahayu¹ and Andri Kusdianto^{2*}

1 Universitas Komputer Indonesia, Bandung, Indonesia

2 Directorate General of Taxation, Indonesia

*Address all correspondence to: andri.kusdianto@pajak.go.id

IntechOpen

© 2023 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

References

- [1] OECD (Organisation for Economic Co-Operation and Development). Tax Administration 3.0: The Digital Transformation of Tax Administration. 2020. Available From: <http://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/taxadministration-3-0-the-digital-transformation-of-tax-administration.pdf>
- [2] ADB. Asian Development Bank. Launching A Digital Tax Administration Transformation What You Need to Know. 2022. DOI: 10.22617/TCS210343. Available From: <https://www.adb.org/sites/default/files/publication/792586/digital-tax-administration-transformation.pdf>
- [3] Sanger C. Tax Authority Approaches to Digital Tax Administration: EY Global Presentation. 2020;5:25-30
- [4] IMF (The International Monetary Fund). TADAT: Tax Administration Diagnostic Assessment Tool (TADAT). 2019. Available From: www.tadat.org/home and <https://www.tadat.org/assets/files/TADAT%20Field%20Guide%202019%20-%20English.pdf>
- [5] Ministry of Finance of the Republic of Indonesia. KMK-Keputusan Menteri Keuangan Nomor. 260/KMK.03/2017 Tentang Program Reformasi Perpajakan
- [6] Singer S, Jokovic B. Economic themes. Digital transformation in tax administration: A literature review. *Economic Themes*. 2020;58(3):369-386
- [7] Park J, Jun S, Kim JY. United Nations ESCAP, Information and Communications Technology and Disaster Risk Reduction Division: Methodology for Data Analysis of Digital Transformation (Version 1). Bangkok; 2022
- [8] OECD (Organisation for Economic Co-Operation and Development). Tax and Digitalisation. 2018. Available From: <https://www.oecd.org/tax/beps/tax-and-digitalisation-policy-note.pdf>
- [9] Barr R. Digital Administration Maturity. EY. 2021. Available from: https://www.ey.com/en_gl/tax/digital-tax-administration-maturity
- [10] IMF (International Monetary Fund). Use of technology in tax administration Core information technology systems in tax administration. In: Technical Notes and Manual No. 17/02. Washington DC; 2017. p. 3
- [11] ICAEW. Digitalisation of Tax: International Perspectives. 2019 <https://www.icaew.com/-/media/corporate/files/technical/technology/thought-leadership/digital-tax.ashx>
- [12] EY Forbes. Data & Advanced Analytics: High Stakes, High Rewards. 2017. Available From: https://i.forbesimg.com/forbesinsights/ey_data_analytics_2017/EY_Data_Analytics_Report.pdf
- [13] British Standard-BS ISO 31000:2018. Risk Management Guidelines. 2018. Available From: www.iso.org
- [14] Kagermann H, Lukas WD, & Wahlster W. Industrie 4.0: Mit dem Internet der Dinge auf dem Weg zur 4. Industriellen Revolution. 2011. Available From: <http://www.vdi-nachrichten.com/Technik-Gesellschaft/Industrie-40Internet-Dinge-Weg-4-industriellen-Revolution>
- [15] OECD (Organisation for Economic Co-Operation and Development). Compliance Risk Management:

Challenges of Digital Tax Administration Transformation in Indonesia
DOI: <http://dx.doi.org/10.5772/intechopen.111458>

Managing and Improving Tax
Compliance. 2004. Available
from: [https://www.oecd.org/tax/
administration/33818656.pdf](https://www.oecd.org/tax/administration/33818656.pdf)

[16] Directorate General Taxation.
Ministry of Finance of the Republic of
Indonesia. Kebijakan Pemeriksaan Pajak
(Seri Pemeriksaan Pajak 01-03). Surat
Edaran Nomor. SE-01/PJ.7/2003