

March 2015



INTEGRATED CASE MANAGEMENT SYSTEM

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CONTENTS

<i>Auditor General's Comments</i>	3
<i>Executive Summary</i>	5
<i>Report Highlights</i>	8
<i>Summary of Recommendations</i>	9
<i>Response from the Ministry</i>	10
<i>Background</i>	14
<i>Part I: An Audit on Managing Access and Data Quality</i>	16
<i>Overview</i>	16
<i>Audit Objectives and Scope</i>	16
<i>Audit Conclusion</i>	18
<i>Key Findings and Recommendations</i>	18
<i>Part II: A Review of ICM Project Scope And Costs</i>	24
<i>The Scope of this Work</i>	24
<i>What We Found</i>	24
<i>Appendix A: ICM Project Timeline</i>	28
<i>Appendix B: Status of Legacy System Replacement</i>	31

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The Honourable Linda Reid
Speaker of the Legislative Assembly
Province of British Columbia
Parliament Buildings
Victoria, British Columbia
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Dear Madame Speaker:

I have the honour to transmit to the Legislative Assembly of British Columbia my report, *Integrated Case Management System*.

We conducted this audit under the authority of section 11 (8) of the *Auditor General Act* and in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (CPA Canada) in the CPA Canada Handbook - Assurance.



Carol Bellringer, CPA, FCA
Auditor General
Victoria, British Columbia
March 2015

AUDITOR GENERAL'S COMMENTS

THE INTEGRATED CASE MANAGEMENT (ICM) system was intended to improve delivery of social programs and supports, but it has not met expectations. In partnership with the Ministry of Children and Family Development (MCFD) and the Ministry of Technology, Innovation and Citizens' Services (MTICS), the Ministry of Social Development and Social Innovation (MSDSI) spent \$182 million on a system that has not fulfilled key objectives.

According to the ministries, ICM was completed in November 2014, on time and on budget. However, the ministries replaced only one-third of the aging and inflexible legacy systems initially planned. ICM was an ambitious and critical project, and we appreciate the steps taken to control costs, but ICM and the legacy systems must now run concurrently.

At the time of our review, all of the costs related to the project were not fully available. Therefore, one of the eight recommendations in the report is for MSDSI to prepare the full costs for the life of the project, consistent with the business case.

In this audit, we examined access to ICM and data quality. We found that personal information was not fully safeguarded, risking loss of privacy and confidentiality. As project lead, MSDSI did not always protect confidential information by limiting access to need-to-know, and they did not monitor for inappropriate activity. There may have been security breaches without the ministry's knowledge. My Office identified similar issues in previous audits of the JUSTIN, PARIS and CORNET systems.

We also found that information used to identify clients in ICM was not always accurate or complete, and duplicate records existed. Systems like ICM are only as good as the data entered into them. Difficulty recording and finding information can reduce valuable time staff spend with clients. The ministry has processes in place to manage data quality, but it needs to do more.



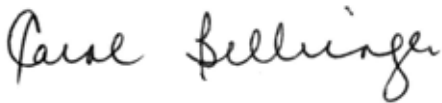
CAROL BELLRINGER, CPA, FCA
Auditor General

AUDITOR GENERAL'S COMMENTS

It is important to note that we did not look at access or data quality in the legacy systems, yet the ministries should consider that the risks in ICM may also apply to the legacy systems.

The recommendations in this report summarize 46 highly technical recommendations that we provided earlier to MSDSI. While our audit findings are recorded as of the time of the audit, we understand that the ministry already addressed some of the issues.

Thank you to the ministries involved for their cooperation with this audit and their staff for their dedication in providing valuable social programs and supports.



Carol Bellringer, CPA, FCA

Auditor General

Victoria, BC

March 16, 2015

EXECUTIVE SUMMARY

What is the integrated case management system?

In 2006, amid growing public demand in BC for increased government coordination to protect vulnerable individuals from violence and harm, an independent review of the province's child protection system called for greater information sharing and collaboration among all agencies involved.

In response, the government launched the Integrated Case Management (ICM) system project in 2008 – a joint initiative of the:

- ◆ Ministry of Technology, Innovation and Citizens' Services (MTICS)
- ◆ Ministry of Social Development and Social Innovation (MSDSI)
- ◆ Ministry of Children and Family Development (MCFD)¹

The purpose of the project was to integrate multiple program areas and systems from MSDSI and MCFD into a single system, both to improve information sharing and case management across the social services sector, and to replace disparate, aging legacy systems no longer considered sustainable for program delivery.

In November 2014, MSDSI and MCFD announced they had completed the project on time and on budget, at a total capital cost of \$182 million.

Our scope of work

The ICM system was intended to enable the two ministries to deliver key social programs more effectively and efficiently than before.

Two aspects of this large and complex undertaking drew our attention: access and data quality management.

The new system processes and stores vast amounts of data, including personal information (in some cases, highly sensitive) for more than 2.5 million individuals. Protecting this information from inappropriate access is important for preventing loss of privacy or fraudulent use of personal information. Just as important, is establishing good data quality management practices for the system. Information that is incomplete, inaccurate or hard to find hampers the ability of workers to provide services. In many situations – but child protection cases, in particular – such delays can have serious consequences.

With these concerns in mind, we conducted our audit between November 2013 and July 2014, before full implementation of the ICM system in November 2014. We wanted to determine whether MSDSI, as project lead, had ensured that:

1. access to ICM was properly managed to protect client information from inappropriate access
2. data was managed to ensure the quality of client records in ICM

¹ At the time, MTICS was the Ministry of Labour and Citizens' Services, and MSDSI was the Ministry of Employment and Income Assistance.

EXECUTIVE SUMMARY

We present the results of our audit in Part I of this report.

As well, in light of discussions in the Legislative Assembly and public concern over ICM's implementation and purported cost overruns, we undertook a review of the project's scope and costs. We present the results of our review in Part II of this report.

Note: In October 2014, we gave MSDSI a detailed technical report of our audit findings and recommendations on access and data quality management. The information was intended to provide MSDSI with the opportunity to consider making some changes to the system, based on weaknesses we had identified. The ministry responded positively and has told us that it has already addressed many of the deficiencies we summarize in this report.

Key findings

The implementation of large and complex IT projects like ICM are often high-risk. Successful implementation can provide significant benefits and value for service delivery to the public. However, these projects often fail to meet expectations around such factors as timelines, budget, scope, quality and outcomes.

Management of system access and data quality

Based on our audit of access and data quality, we concluded that MSDSI:

- ♦ did not properly manage access to protect client information from inappropriate access
- ♦ did not fully manage data to ensure the quality of client records in ICM

There were significant deficiencies with access management and data quality management in the new system. Although our findings were based on audit work conducted before ICM's full implementation, we did not expect such deficiencies in a relatively new and modern system. Implementing appropriate measures for managing access and data quality is fundamental to any major IT system.

Access management – We found that MSDSI did not adequately manage access to ICM to prevent inappropriate access to client information. Access was not always provided on a need-to-know basis. As well, essential monitoring was not in place for detecting inappropriate access and activity. This creates a risk that client information could be inappropriately accessed without the ministries' knowledge.

Data quality management – We found that MSDSI had identified significant issues with the quality of client records in ICM (including duplicate records, invalid data and incomplete records). To address this, MSDSI implemented a team of data stewards, completed a large-scale remediation project, and introduced a new data quality tool for implementation in the last phase of the project. However, the ministry could improve review and monitoring processes to address systemic issues and measure data quality on an ongoing basis. Any system is only as good as the information it contains; and, in the case of ICM, working through poor quality data uses up valuable time that staff can spend with clients.

EXECUTIVE SUMMARY

Overall project scope and costs

The ICM project did not fully replace legacy systems as initially planned. At project completion, about one-third of the legacy systems had been replaced. This means that a number of systems characterized as antiquated and expensive to maintain must continue to run. However, at the time of our review, the ICM project team was unable to provide details regarding the ongoing financial impact on operations. More importantly, this undercuts the original vision for a single integrated system across the social services sector.


The reported project capital cost for ICM was \$182 million. Supplemental capital requests for about \$13 million were also made, which MSDSI said were to meet additional requirements outside the original scope for the ICM project. And, as with any systems implementation project, there were also operating costs associated with development, implementation and maintenance of ICM.

We were unable to confirm the figures for the capital and operating costs, or to determine whether they were within budget, because the project had not yet been completed at the time of our review.

Looking ahead

Our work on the audit of government's financial statements will include an examination of the costs associated with ICM. In addition, our Office has a number of audits in progress that focus on monitoring government's efforts to manage large IT projects.

REPORT HIGHLIGHTS



Government spent
\$182
MILLION
on ICM
and the system has not fulfilled key objectives.

client information
was sometimes **INCOMPLETE**
and **DUPLICATE** records exist.


8 RECOMMENDATIONS

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.



2/3
of legacy systems
HAD NOT BEEN REPLACED

Client Information was
NOT ALWAYS SAFEGUARDED



on time,
on budget,
but not
on scope

ICM serves
200,000
clients
every year



SUMMARY OF RECOMMENDATIONS

WE RECOMMEND THAT THE MINISTRY OF SOCIAL DEVELOPMENT AND SOCIAL INNOVATION:

- 1** ensure that access to ICM is based on defined business and security requirements.
- 2** ensure that access to ICM is updated promptly and regularly reviewed.
- 3** ensure that access to restricted client records in ICM is appropriately assigned only to those with a defined need.
- 4** ensure that ICM system administration accounts are properly managed.
- 5** conduct regular monitoring of ICM for inappropriate access and activity.
- 6** improve system and review processes to enhance the quality of client records in ICM.
- 7** implement a regular compliance program to assess, monitor and improve data quality in ICM on an ongoing basis.
- 8** prepare a full accounting of ICM capital and operating costs for the life of the project, consistent with details provided in the business case.

We encourage the Ministry of Social Development and Social Innovation to work collaboratively with the Ministry of Children and Family Development and the Ministry of Technology, Innovation and Citizens' Services to address our recommendations.

RESPONSE FROM THE MINISTRY

OF SOCIAL DEVELOPMENT AND SOCIAL INNOVATION

THE MINISTRY OF Social Development and Social Innovation (SDSI) would like to thank the Auditor General for reviewing access controls and data quality in the Integrated Case Management (ICM) system.

The ministry takes very seriously the importance of privacy, security and data quality, and is committed to ensuring ongoing due diligence in this regard. We have reviewed the Auditor General's findings and recommendations in detail and have taken prompt and appropriate action in addressing them where appropriate.

ICM was a large and complex project and in an effort to manage the related risks, a phased implementation was recommended and approved by Treasury Board in January 2010. The Auditor General's audit was conducted after three of the four project phases had been completed and a year prior to the completion of the system in November 2014. The audit used a data snapshot from November 2013, before key functionality was completed. We are pleased that the audit recommendations regarding access controls and data quality management validated the ICM Phase 4 project activities that were in progress at the time of the audit. For example, at the time of the review, work was underway on the introduction of a data quality tool to improve search capability and functionality; the completion of a data remediation project; completion of user profiles, and improved security monitoring and reporting.

The ICM system was designed to be compliant with the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and other related policies to ensure the privacy, security and confidentiality of client information. A series of key reviews were completed prior to launch of each phase of ICM, including Privacy Impact Assessments (PIA) which are posted publicly on the ICM website (<http://www.integratedcasemanagement.gov.bc.ca/privacy.html>). The project team provided numerous privacy and security briefings to the Office of the Information and Privacy Commissioner ("OIPC") during each phase of ICM. The OIPC also reviewed the project team's privacy impact assessment ("PIA") for each phase and provided its comments through letters that are posted on the ICM website. As part of the due diligence and prior to Phase 4, the project team also partnered with key technology vendors and the Office of the Chief Information Officer to review the system.

The final phase of the ICM project included the implementation of security reporting to enable the essential monitoring required to ensure user access is updated in a timely manner. Controls have been strengthened and access is provided on a "need-to-know" basis, as defined by SDSI/CFD program areas and security requirements.

RESPONSE FROM THE MINISTRY OF SOCIAL DEVELOPMENT AND SOCIAL INNOVATION

As the Auditor General noted, the ministry needs to monitor data quality and has completed key initiatives to improve data quality and continues to make this a priority. It should be noted, that as a part of Phase 4, the data remediation project exceeded the goals pertaining to data remediation and tools have been implemented to ensure data quality continues to be a top priority.

As a result of an external review commissioned by the Ministry of Children & Family Development in 2012, recommending that ICM be assessed related to child protection practices, the project approach was adjusted to work within the approved \$182M capital budget. The ministry has implemented technical changes to make the system more responsive and user-friendly.

The ministry has successfully implemented a modern technology platform that improves information sharing and provides better tools for frontline workers

who provide services to citizens accessing social services. Through the four phases of implementation, the ICM system has replaced a number of separate computer systems. Through detailed planning, a number of legacy systems were not appropriate to replace, while others could not be replaced because they are dependent on other government systems.

Despite the challenges, the fundamental reasons for moving to a new system remain – it provides our staff with the tools they need to better support vulnerable children and families across British Columbia. Since the launch of Phase 4 in November 2014, staff using the upgraded system have provided positive feedback that the ICM system reflects their input and best practice research.

RESPONSE FROM THE MINISTRY OF SOCIAL DEVELOPMENT AND SOCIAL INNOVATION

The ministry has made progress against the Auditor General's recommendations and will continue to address the findings and recommendations:

Recommendation 1:

Ensure that access to ICM is based on defined business and security requirements.

Complete - As a part of Phase 4, ICM system security profiles were reviewed in detail and updated to reflect current program area and security requirements. Job titles were further standardized and process documentation and approval processes were updated and improved.

Recommendation 2:

Ensure that access to ICM is updated promptly and regularly reviewed.

Complete - Regular review cycles using new user access monitoring capabilities have been implemented.

In progress - These reviews will continue on an ongoing basis to ensure that all available reporting regarding user changes are added to the security review processes.

Recommendation 3:

Ensure that access to restricted client records in ICM is appropriately assigned only to those with a defined need.

Complete - Security administration staff have worked with SDSI/CFD program area staff in the ministries to review and update the process and policy requirements for restricted records and to ensure adherence to the principle of 'least access'.

In progress - Continuous improvement of the policy will ensure the policy meets SDSI/CFD's needs. Access review processes are being updated to include regular reviews. Security Administration staff continue to work with SDSI/CFD program area leads to ensure policy and/or service delivery changes that affect access requirements are updated promptly.

Recommendation 4:

Ensure that ICM system administration accounts are properly managed.

Complete - User account management processes, and related security procedures have been updated. All user accounts were reviewed as part of ICM Phase 4.

In progress - Security Administration staff are strengthening compliance requirements with external agencies and service providers.

RESPONSE FROM THE MINISTRY OF SOCIAL DEVELOPMENT AND SOCIAL INNOVATION

Recommendation 5:

Conduct regular monitoring of ICM for inappropriate access and activity.

Complete - As part of ICM Phase 4, user access monitoring capabilities were implemented; as well, audit logging was reviewed and enabled.

In progress - Staff are using this user access monitoring functionality.

Recommendation 6:

Improve system and review processes to enhance the quality of client records in ICM.

Complete - As part of ICM Phase 4, significant system improvements were made to the data quality and search functionality in the system through implementation of a data quality tool. We have also improved awareness and business procedures that support ministry program areas to ensure quality of client records.

In progress - We are implementing data quality improvements using the new data quality tool.

Recommendation 7:

Implement a regular compliance program to assess, monitor and improve data quality in ICM on an ongoing basis.

Complete - As part of ICM Phase 4 implemented in November 2014, data quality was improved by conducting a clean-up of data to remove duplicate records. Data quality management activities were augmented as part of ICM Phase 4, and a compliance program was established and implemented.

In progress - An ongoing data quality management program has been designed and will be implemented in 2015.

Future - Monthly meetings with key SDSI/CFD program areas will contribute to ongoing data quality improvements.

Recommendation 8:

Prepare a full accounting of ICM capital and operating costs for the life of the project, consistent with details provided in the business case.

Complete - The ministry provides quarterly reporting to the Ministry of Finance which is standard practice across government for capital projects over \$50M.

Future - The ministry will prepare a full accounting of the project costs. In addition, the ministries report out operating and capital costs through the yearly public accounts process.

BACKGROUND

THE MINISTRY OF Social Development and Social Innovation (MSDSI) and the Ministry of Children and Family Development (MCFD) spend a combined \$3.8 billion annually on key social programs, including child welfare, child care, services for children with special needs, income assistance and employment services. More than 200,000 individuals and families in BC access these services every year.

Over the years, public demand has grown for better service coordination by government in protecting vulnerable individuals from violence and harm. For example, the [2006 Hughes Review](#) (see sidebar), an independent review of the child protection system, called for greater information sharing and collaboration among ministries and agencies to reduce risk and provide more coordinated and effective services for vulnerable children and youth.

THE HUGHES REVIEW

Also known as the *BC Children and Youth Review*, the Hughes Review was an independent review of BC's child protection system. The Minister of Children and Family Development requested the review following intense criticism of the province's system for reviewing child deaths. The review began in November 2005. The final report, released in April 2006, contained 62 recommendations to improve the child protection system. It also resulted in the creation of an independent advocacy and oversight body – the Representative for Children and Youth – and the *Representative for Children and Youth Act*.

The need to deliver better, more closely integrated programs and supports to people at risk was the catalyst for developing a new case management system – a system that would provide a single, comprehensive record of a client and his or her circumstances, and enable MSDSI and MCFD to deliver services more efficiently and effectively. The system that government undertook to implement is an integrated case management (ICM) system.

The ICM project was launched in 2008 as a partnership of three ministries: MSDSI, MCFD and the Ministry of Technology, Innovation and Citizens' Services. The Ministry of Social Development and Social Innovation had lead responsibility for project delivery², but all three ministries were responsible for the direction of the project.

The ICM project was intended to address the business needs of MSDSI and MCFD for delivering social programs. The Ministry of Technology, Innovation and Citizens' Services provided the infrastructure and network services support for the new system.

² As indicated in Appendix A, lead responsibility was transferred from MTICS to MSDSI prior to implementation of Phase 1.

BACKGROUND

Together, MSDSI and MCFD identified more than 50 legacy systems for potential replacement by the single ICM system. The most significant of those legacy systems had been in use for over 30 years. The information contained in the new system would be used to better manage client services, and also be available for research, evaluation and planning at the program and ministry levels. Both ministries would depend on ICM for their operational success.

The ICM project had three main objectives:

- ◆ improve information sharing in a privacy-protected manner to provide better integration of services
- ◆ replace numerous, aging and inflexible legacy systems with a single, integrated case management solution
- ◆ support front-line staff by providing better tools and simplification of business processes so that ministry staff can spend more time in direct delivery of services to clients

The ICM system was implemented in four phases over six years (see [Appendix A](#) for a timeline of the project):

- ◆ Phase 1: implemented November 29, 2010
- ◆ Phase 2: implemented April 2, 2012
- ◆ Phase 3: implemented March 4, 2013
- ◆ Phase 4: implemented November 24, 2014

As project lead, MSDSI contracted the services of a private vendor to implement ICM. The vendor was responsible for providing system integration services and implementation, and remains responsible for maintenance and support of the system. The ministry is responsible for vendor management, system operations and security management.

The ICM system is connected to several other IT systems, including financial systems for invoice and payment processing. Functions in ICM include:

- ◆ creating contact records for clients and service providers
- ◆ initiating service applications
- ◆ establishing applicant eligibility
- ◆ determining benefit amounts
- ◆ providing assessment tools to help workers assess and respond to risks

At the time of our audit, there were about 9,400 users (6,300 ministry employees and 3,100 external agencies and service providers) accessing ICM and providing support and services in regions and communities across the province.

DEFINITION OF A USER

A *user* is a person who accesses a computer system to get information or to perform business functions. In ICM, users include ministry staff, external agencies and service providers.

PART I:

AN AUDIT ON MANAGING ACCESS AND DATA QUALITY

OVERVIEW

THE VISION FOR THE ICM SYSTEM IS: *The right information to the right people at the right time, in a secure manner that protects privacy and improves outcomes for citizens through the cohesive delivery of social services.*

Our audit looked at the first two components of this vision statement: about getting “the right people” (access management) “the right information” (data quality management).

Access management

Large integrated information systems like ICM are intended to improve information sharing across programs and to support better decision making. However, given the volume of information in such a system, it is challenging to ensure that this information is not only accessible to those who need it, but also secured and protected from those who should not have it (i.e., inappropriate access).

The ICM system holds personal information for more than 2.5 million individuals. A compromise in the system could result in loss of individual privacy or fraudulent use of personal information. One of the stated outcomes for ICM is keeping information safe and secure, and also shared appropriately.

Data quality management

Systems like ICM rely on the quality of the data and information they contain. Accurate, accessible and complete information is fundamental to the development and operation of any technology system. Client information in ICM is shared by a number of programs across MSDSI and MCFD. Incorrect client

identification could result in erroneous record updates, causing incorrect assistance or risks to personal safety (as in the case of child protection). Both MSDSI and MCFD recognize that ICM must provide accurate client identification for effective program delivery.

AUDIT OBJECTIVES AND SCOPE

Our objectives in examining the ICM system were to determine whether MSDSI had ensured that:

1. access to ICM was properly managed to protect client information from inappropriate access
2. data was managed to ensure the quality of client records in ICM

In examining access management, we focused on the measures necessary to limit access to need-to-know (i.e., access is provided only to those who require it to perform their jobs). In examining data quality management, we focused primarily on the quality of client identification information. The scope of our audit is summarized below:

PART I: AN AUDIT ON MANAGING ACCESS AND DATA QUALITY

Audit objective	In scope	Out of scope
1. Access management	<ul style="list-style-type: none"> how the ministry defined and managed user access to client information in ICM 	<ul style="list-style-type: none"> whether users accessed the correct information for delivering services to clients access management by service providers and external agencies access to legacy, backup or other systems containing ICM client information
2. Data quality management	<ul style="list-style-type: none"> how the ministry managed the quality of client records* in ICM how well the ministry managed the conversion of client records from legacy systems to ICM 	<ul style="list-style-type: none"> whether services were provided to the right client whether clients received the appropriate services

* The term “client records” refers to ICM contact records that belong to clients. It does not include case, incident or other records that are associated with client records.

We developed our audit objectives based on the stated vision and goals of the ICM project, international standards for information security and COBIT 5 (see sidebar).

ISO AND COBIT 5

International standards for information security refers to *ISO/IEC 27002 on Information Technology – Security Techniques – Code of Practice for Information Security*, which is issued by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

COBIT 5 is a business framework for the governance and management of enterprise IT. It was developed by a global task force and development team from the IT Governance Institute.

We conducted the audit in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (CPA Canada) in the CPA Canada Handbook—Assurance and Value-for-Money Auditing in the Public Sector, Section PS 5400, and under the authority of Section 11(8) of the *Auditor General Act*.

We carried out this work between November 2013 and July 2014, before full implementation of ICM. Our work involved:

- ♦ obtaining access to a copy of the ICM database (taken November 26, 2013)
- ♦ interviewing ministry executives, IT support staff, project staff and program area staff
- ♦ verifying ministry business practices and processes
- ♦ reviewing policies, procedures and other documentation

PART I: AN AUDIT ON MANAGING ACCESS AND DATA QUALITY

AUDIT CONCLUSION

Based on our audit of access and data quality, we concluded that MSDSI:

- ◆ did not properly manage access to protect client information from inappropriate access
- ◆ did not fully manage data to ensure the quality of client records in ICM

KEY FINDINGS AND RECOMMENDATIONS

Access management

Access to information must be managed to ensure that the security and integrity of the information are maintained. Access should be based on business needs and security requirements. Excessive or inappropriate access can result in security breaches and loss of privacy. Unmonitored access can result in information being inappropriately accessed without the ministries' knowledge.

We therefore assessed whether MSDSI had ensured that:

- ◆ access to ICM was defined by business and security requirements
- ◆ user accounts in ICM were properly managed
- ◆ access to restricted client records in ICM was appropriately assigned
- ◆ system administration accounts in ICM were properly managed
- ◆ access to ICM was monitored for inappropriate access and activity

Finding 1 – Access to ICM was defined based on business and security requirements, but was not consistently applied.

An access model defines how access should be implemented and controlled in a system. We expected to find that a formal access model had been defined and implemented for ICM based on business and security requirements. More specifically, we expected to find that these requirements were based on job roles and the principle of need-to-know.

We found that the model developed by MSDSI and MCFD for defining access to ICM was consistent with our expectations. However, the model was not consistently applied: more than one-third of the total 9,400 users were given access outside of the defined access model. This is significant because users may have access beyond what they require, which adds to the risk of inappropriate access.

RECOMMENDATION 1: *We recommend that the Ministry of Social Development and Social Innovation ensure that access to ICM is based on defined business and security requirements.*

PART I: AN AUDIT ON MANAGING ACCESS AND DATA QUALITY

Finding 2 – User accounts in ICM were not properly managed.

A well-designed user account management process ensures users are given the right level of access. This process should be ongoing because users change jobs, leave employment, or take extended leave. We expected to find that security administrators appropriately assigned user access, promptly changed or removed access as required, and periodically reviewed access to ensure it was kept current and appropriate.

We found that both MSDSI and MCFD had formal user account management processes. However, ongoing account maintenance was not properly managed to ensure user access remained appropriate. We found that the ministries, in some cases, did not immediately remove or change user access when employment status or job function changed. Also, both ministries lacked an effective process to communicate these changes to security administrators in a timely manner, and there was no regular review to ensure access was required or appropriate. As a result, a number of users still had access that was neither required nor appropriate.

RECOMMENDATION 2: *We recommend that the Ministry of Social Development and Social Innovation ensure that access to ICM is updated promptly and regularly reviewed.*

Finding 3 – Access to restricted client records in ICM was not always appropriately assigned.

Access to restricted client records should be limited when broader access could result in harm to an individual. We expected to find that access to restricted client records was appropriately limited to those who require access for their jobs.

We found that ICM has functionality that enables MSDSI and MCFD to limit access to restricted records based on job roles. Access to restricted records was appropriately limited to those program area staff (such as team supervisors for the child protection program) who required access for their jobs. However, we found that a number of other staff (such as policy analysts) also had access to restricted records even though their need for access had not been defined.

Ministry policy restricts staff from accessing specific client records when, for example, there is a perceived conflict of interest or a risk that confidentiality may be compromised. However, we found that ICM was unable to prevent access to specific records for those staff who had already been given general access to restricted records.

Furthermore, we found that MSDSI and MCFD had not reviewed access to find out whether access to restricted records was properly assigned. As a result, there is a risk that client information held in restricted records could be inappropriately accessed without the ministries' knowledge.

RECOMMENDATION 3: *We recommend that the Ministry of Social Development and Social Innovation ensure that access to restricted client records in ICM is appropriately assigned only to those with a defined need.*

PART I: AN AUDIT ON MANAGING ACCESS AND DATA QUALITY

Finding 4 – System administration accounts in ICM were not properly managed.

System administrators are users who have an elevated level of access so that they can manage and provide system and support services, such as security and maintenance services. These users have access to vast amounts of confidential data, and the ability to make changes to system setup and records. There is a higher risk associated with this level of access. MSDSI is responsible for the security and system administration functions for both MSDSI and MCFD. We expected to find that MSDSI had a process in place to manage system administration accounts effectively.

We found that system administration accounts were not regularly reviewed for validity, and changes made to these accounts were not always approved. Although most system administration accounts that we selected for review were confirmed to have correct access, we found there were a number of temporary system administration accounts that remained active, even though these accounts were no longer required. At the time of our audit, there was one reported incident that showed unauthorized changes were made to a few system administration accounts. Ineffective management of these accounts can contribute to system failures and security breaches.

RECOMMENDATION 4: *We recommend that the Ministry of Social Development and Social Innovation ensure that ICM system administration accounts are properly managed.*

Finding 5 – Monitoring of ICM for inappropriate access and activity was deficient.

Monitoring is critical for detecting inappropriate access and activity. As users access the system, information is collected and stored in audit logs, which can then be used to identify and analyze unusual patterns of activity.

We expected to find that MSDSI recorded and retained pertinent information in audit logs for access monitoring, and used automated log management tools to detect and analyze these activities. We found, however, that MSDSI did not proactively monitor for inappropriate access and activity, and investigated security-related incidents only on an ad hoc basis. As a result, inappropriate access or activity may have taken place without the ministries' knowledge.

RECOMMENDATION 5: *We recommend that the Ministry of Social Development and Social Innovation conduct regular monitoring of ICM for inappropriate access and activity.*

PART I: AN AUDIT ON MANAGING ACCESS AND DATA QUALITY

Data Quality Management

The ICM system is contact-centric, meaning it relies on information in contact records (see sidebar) for client identification and case management. The quality of data in client records significantly affects the accuracy of client identification and, by extension, service delivery.

We therefore expected to find that MSDSI was effectively managing the quality of client records.

Our examination of client records focused on whether MSDSI:

- ◆ had adequately managed data quality during conversion from legacy systems to ICM
- ◆ had put preventative measures in place to ensure that accurate and complete client identity information was recorded during intake
- ◆ was managing the quality of client records in ICM on an ongoing basis

AN EXPLANATORY NOTE: CONTACTS AND CLIENTS

The ministries have defined a *contact* as anyone who needs to be tracked within ICM, and may include “clients, family members of clients, foster parents, lawyers, counsellors, physicians, service provider staff, police officers, complainants, and the general public”. A *client* is someone who receives social assistance or services. Thus, all clients are contacts, but not all contacts are clients.

Finding 6 – The Ministry of Social Development and Social Innovation did not adequately manage data quality during conversion.

About 2.3 million contact records (including client records) were converted from legacy systems to ICM. We expected to find that data quality was assessed in legacy systems, and that incorrect, poorly formatted and duplicate data was cleansed during conversion to ICM.

We found that MSDSI had a sound data conversion strategy in place that was consistent with good practice. This included assessing the quality of data in legacy systems and cleansing data prior to migration into ICM. We also found that the strategy included appropriate measures for testing and validating the conversion process.

Although MSDSI had assessed some aspects of data quality during conversion, the extent of data quality assessment and cleansing was inadequate. In particular, we found that the process identified only a limited number of potential duplicate records for cleansing. We also found that MSDSI did not address all identified data quality issues during the conversion process.

Ministry staff told us they lacked the technology to carry out the conversion tasks economically: the process required substantial manual effort by front-line staff. Recent remediation work to remove duplicate records confirmed that a large number of duplicate contacts existed. Our analysis indicated that the majority of these duplicate records came from legacy systems.

PART I: AN AUDIT ON MANAGING ACCESS AND DATA QUALITY

Failure to adequately assess and cleanse data during the Phase 2 conversion of contact records undermined data quality in ICM, and resulted in the need for substantial remediation efforts in later phases to improve data quality.

Finding 7 – Preventative measures did not adequately ensure the correct recording of client identity information during intake.

Preventative measures are undertaken to ensure the completeness and accuracy of information when it is entered into the system. These measures may be system-based or embedded in business practices. We expected to find that, where appropriate, preventative measures were in place to ensure that client information entered into ICM was complete, accurate and unique. And, where preventative measures were not feasible, we expected to find other measures set up to identify and correct errors on an ongoing basis.

The preventative measures we found during our audit were largely ineffective: system-based controls were limited, and the effectiveness of business practices varied by program area. Business and legislative requirements for collecting client information vary by program area, which makes standardization difficult. As a result, requirements for creating a new client record were minimal, and the quality of the information collected for some program areas may not have been sufficient to support accurate contact identification. This creates a risk that incomplete, inaccurate or duplicate information may have been created.

We found that the requirements for client identification varied by program area. Programs that provide financial benefits, such as income assistance and child care subsidy, had more rigorous identification requirements for applicants, and focused on ensuring information accuracy. These requirements included, for instance, applying a unique identification number (such as a social insurance number or personal health number) to a record, which creates a specific searchable number to prevent confusion among individuals with the same name. On the other hand, programs that provide social services or respond to child protection incidents often lacked the authority or business requirements to collect identity-proofing information. Consequently, the accuracy and completeness of information varied, which could compromise data quality and make record searches difficult.

At the time of our audit, the system search and potential duplication detection functionality were rudimentary and largely ineffective. The ICM system flagged only potential duplicates based on an exact match (First Name, Last Name, Date of Birth and Gender). Phonetic search was not available for names that sound similar (for example, Jon versus John). Furthermore, the effectiveness of the search was dependent on the accuracy and completeness of information. If there was an error (for example, a misspelled name or an incorrect date of birth) or missing information, the system would not detect the duplicate.

We found that MSDSI was instead relying on individual program areas to ensure the quality of

PART I: AN AUDIT ON MANAGING ACCESS AND DATA QUALITY

information they entered into ICM. There was no central oversight or review to identify areas of greater risk or to develop processes specific to program areas to improve information accuracy. Because ICM depends on shared client information across program areas, poor data quality in one area impacts all other areas. This means that existing information may be difficult to find in the system and that duplicate records will be created.

RECOMMENDATION 6: *We recommend that the Ministry of Social Development and Social Innovation improve system and review processes to enhance the quality of client records in ICM.*

Finding 8 – Data quality of client records was managed on an ongoing basis, but the ministry’s approach could be improved.

Good data quality management practices can improve information reliability and support efficient and effective program delivery. We expected to find that MSDSI identified and addressed data quality issues in a timely and effective manner, monitored the state of data quality on an ongoing basis, and identified opportunities for continuous improvement.

We found that MSDSI was aware of data quality issues in the system and working to address them. A team of data stewards had successfully identified, prioritized and addressed a number of data quality issues. Data correction is an important activity that contributes to improved data quality in ICM; however, at the time of the audit, data quality issues persisted.

As the lead ministry for the project, MSDSI recently completed a substantial one-time effort to remediate duplicate records and several other data quality anomalies. The ministry reported that the volume of records remediated was significant. Additionally, the implementation of a new enterprise data quality tool should improve data quality. However, it is too soon to determine the effectiveness of these efforts. The ministry will need to measure and monitor results to know the impact these efforts have on improving data quality.

At the time of our audit, ICM contained over 2.5 million client records. The quality of those records depends largely on the programs a client is associated with. Although MSDSI has identified the nature and volume of a number of data quality issues, we found the ministry could improve data quality monitoring. The overall picture of data quality was absent and, because MSDSI had not established data quality baselines or thresholds for individual program areas, it did not know the degree to which data met expected or acceptable levels of quality. Moreover, MSDSI had not analyzed data quality in relation to the composition of contact records (clients or non-clients, active or inactive, or a breakdown of clients by program area) to identify areas where there was greater risk of poor client information.

RECOMMENDATION 7: *We recommend that the Ministry of Social Development and Social Innovation implement a regular compliance program to assess, monitor and improve data quality in ICM on an ongoing basis.*

PART II:

A REVIEW OF ICM PROJECT SCOPE AND COSTS

THE SCOPE OF THIS WORK

THE ICM PROJECT was initiated in 2008, and was approved to proceed in November 2009 with a target completion of September 2014. Budgeted capital funding was \$182 million. In a joint statement, MSDSI and MCFD announced that the ICM project had been completed on November 24, 2014, on time and on budget.

We conducted a review to determine whether MSDSI completed the ICM implementation as initially planned. In this part of the report, we highlight our key findings on project scope and cost.

We carried out our review under the authority of Section 11(8) of the *Auditor General Act*. It is important to note that **we have not performed an audit on matters pertaining to costs, benefits, savings and functionality and therefore do not express assurance on this information.**

WHAT WE FOUND

ICM project scope

The scope of ICM implementation was not fully completed as initially planned. The legacy systems were partially replaced, but some key functions in ICM still depend on legacy systems for full operation. At the time of our review, MSDSI had not yet announced any

further work to replace the remaining legacy systems or the ongoing cost to operate them.

In March 2013, the ICM Project Board reassessed the ICM project status and adjusted the scope to address priority issues in the MCFD child welfare program. Because of system and usability issues, the Project Board invested significant effort and budget into stabilizing child welfare functionality.

MAJOR FACTORS CONTRIBUTING TO SCOPE REDUCTION OF THE ICM PROJECT:

- ◆ the decision to focus on meeting MCFD's critical business needs while remaining within budget and timeline constraints
- ◆ changes in the practice model, which resulted in changes to system requirements for the MCFD child welfare program
- ◆ significant remediation efforts to address concerns and improve systems and practices related to the MCFD child welfare program

PART II: A REVIEW OF ICM PROJECT SCOPE AND COSTS

This shift in priority meant there was insufficient budget to completely move programs off the existing legacy systems.

To complete the project on time and on budget, Phases 4 and 5 were merged into a single phase and the scope was reduced (see sidebar on page 24).

Consequently, the functionality and scope of programs and services managed in ICM were less than expected. We found that MSDSI, as the lead ministry for the project, had not accomplished legacy system replacement as initially planned. Of particular concern to us was that MSDSI had not replaced the Management Information System (see sidebar) – the core legacy system for both MSDSI and MCFD.

This means that the two ministries must continue to rely on the Management Information System and other aging legacy systems for program delivery. More significantly, this undercuts the original vision for a single integrated system across the social services sector.

MANAGEMENT INFORMATION SYSTEM

The Management Information System is the legacy case management system for MSDSI and MCFD. It was the key legacy system – built over 30 years ago – identified for replacement by ICM in the business case. Government has often described this system as antiquated, inflexible, aging and costly to maintain. In addition to case management functionality, the Management Information System provided (and in some cases continues to provide) eligibility determination and benefits calculation for program areas such as income assistance.

Legacy system replacement

The government characterized legacy systems as inflexible, antiquated, fragmented and costly to maintain. They indicated that many of these older systems had a “high potential for failure” and pose risks to system and business continuity. There was a business need for replacing these “obsolete” systems with modern technology to deliver better and more efficient services.

More than 50 systems were identified for potential replacement. In particular, the replacement of the Management Information System was set out as a requirement in the initial project scope. Ministry staff told us they did not commit to the replacement of each of these systems. Rather, their intention was to determine replacement needs as the project progressed.

By the end of project completion in November 2014, about one-third of these legacy systems had been replaced (see [Appendix B](#)).

Although we found that MSDSI had completed a substantial amount of conversion, moving some of its and MCFD’s core programs from the Management Information System to ICM, not all programs were converted. Exhibit 1 shows the programs that are currently delivering their services using ICM. A number of programs originally covered in the ICM project scope (in particular, those of MCFD) did not proceed with implementation. The ministries decided not to proceed with the implementation of remaining programs until issues with the child welfare program were addressed.

PART II: A REVIEW OF ICM PROJECT SCOPE AND COSTS

Exhibit 1: Ministry programs delivered through ICM

Ministry of Social Development and Social Innovation	Ministry of Children and Family Development
<ul style="list-style-type: none"> ◆ BC Employment and Assistance (includes income assistance) ◆ Employment Program of BC ◆ Bus Pass ◆ Senior's Supplement 	<ul style="list-style-type: none"> ◆ Child Welfare ◆ Child Care Subsidy ◆ Autism Funding ◆ Medical Benefits

Source: Compiled by the Office of the Auditor General of British Columbia

ICM functionality revised

The April 2013 decision to reduce the scope of ICM implementation means several areas of functionality

were not implemented as initially planned.

In some cases, however, functionality was added as enhancements (see Exhibit 2).

Exhibit 2: Highlight of changes to functionality in ICM

Enhanced functionality:

- ◆ **Child welfare upgrade:** The most significant change includes a number of enhancements to improve functionality in MCFD child welfare, including enhanced intake, case management, relationship functionality and history diagrams.
- ◆ **Channel integration:** Functionality was added to support MSDSI's strategy for better information exchange with the client through telephony and client self-service.
- ◆ **Alternative payment methods:** Methods were added for deploying emergency payments via electronic fund transfer, instead of manual processing.

Reduced functionality:

- ◆ **Full eligibility determination and benefits calculation:** MSDSI had not fully implemented the function for determining eligibility and calculating expected benefits (e.g., for income assistance payments). As a result, ICM still relies on the Management Information System (MIS) to perform a number of additional eligibility and benefits calculations. This means MIS cannot be retired until this functionality is replaced in ICM.
- ◆ **Contract management:** Initially, MSDSI expected to fulfill contract management functionality through a corporate (government-wide) solution, but the corporate solution was never implemented.
- ◆ **Full integration with corporate financial management solution:** MSDSI did not implement the planned full integration of ICM with the government accounting system for contract management and payment generation.
- ◆ **Integration with the corporate Information Access Layer:** This was a government initiative that would have enabled multiple connections between ICM and other government systems. However, government moved away from this initiative, so the functionality was not available.
- ◆ **Modules or add-ons:** MSDSI originally planned for additional functionality – including calendaring, scheduling, risk management, waitlist management, and certification and licensing management – but did not implement this.

Source: Compiled by the Office of the Auditor General of British Columbia

PART II: A REVIEW OF ICM PROJECT SCOPE AND COSTS

Project cost

In a joint statement, MSDSI and MCFD have reported that the project capital costs for ICM implementation was \$182 million. This is consistent with the November 2009 budget for the project.

Additionally, the two ministries requested supplementary capital funding of approximately \$13 million. Ministry staff told us that these requests were treated separately, as they related to new requirements or unforeseen circumstances (for example, requirements to address change in policy or legislation) that could not have been anticipated in the original project scope.

The ministries also incurred operating costs associated with the development, implementation and maintenance of ICM (see sidebar). The ICM project team provided Treasury Board with regular reports on these costs. However, at the time of our review, MSDSI told us that a complete reconciliation of these costs for the life of the project was not yet available, because the project was not yet complete and extensive effort would be required to compile and analyze the information. The ministry indicated that this information would be available after the project is complete.

RECOMMENDATION 8: *We recommend that the Ministry of Social Development and Social Innovation prepare a full accounting of ICM capital and operating costs for the life of the project, consistent with details provided in the business case.*

AN EXPLANATORY NOTE ABOUT SYSTEMS DEVELOPMENT COSTS

As with any large system development project, there are significant costs associated with the acquisition, development, testing and implementation of software for the life of the project. Examples of costs incurred at different stages include:

- ◆ **design and planning:** involves establishing system requirements, evaluating and selecting vendors, and developing a blueprint and implementation plan
- ◆ **application development:** involves software configuration, interfacing, coding, installing hardware, testing and data conversion
- ◆ **post implementation:** involves user training and maintenance for ongoing operation of the system

Costs can be for external vendors (e.g., software acquisition costs and consultant fees for system integration, maintenance and support) or internal staff resources (e.g., training, data conversion and user acceptance testing).

For the purpose of financial reporting, these costs are accounted for, and reported, as either capital or operating costs. The distinction between capital and operating costs is important because it shows how government spending is tracked and reported. Government accounting policies and guidelines define how these costs are to be accounted for. Generally, costs related to configuration and development, and to upgrades and enhancements to provide additional functionality, are treated as capital costs. All other costs are treated as operating costs.

APPENDIX A:

ICM PROJECT TIMELINE

The following table provides a high-level overview of the project timeline, including significant events.

Date	Event summary
March 2008	Treasury Board approves \$107 million in capital for the first three phases of the ICM project. The cost for all five phases is estimated at \$140 million. However, approval of funding for Phases 4 and 5 is deferred until the ministries provide a business case for their implementation.
April 2009	The ministries select Deloitte Inc. as Systems Integrator for the development and implementation of ICM.
October 2009	Treasury Board approves the ministries to enter into an interim contract with Deloitte Inc. to retain key Deloitte resources while the project is re-focusing.
November 2009	<p>The ministries report that the project budget is insufficient and propose a revised five-phase implementation plan that calls for a project capital budget of \$182 million. The increase in the proposed budget is attributed primarily to higher than expected System Integrator costs, and an increase of 18 months to the project timeline.</p> <p>The submission also asks Treasury Board to transfer lead responsibility for the ICM project from the Deputy Minister of Citizens' Services (now MTICS) to the Deputy Minister of Human and Social Development (now MSDSI). This submission represents the most complete and up-to-date business case for the ICM project.</p>
January 2010	Treasury Board approves the revised five-phase implementation plan for the ICM project (\$182 million).
November 2010	As the lead ministry for the project, MSDSI implements Phase 1 on November 29, 2010, and introduces activity planning, document management and basic intake functions for both MSDSI and MCFD. Phase 1 also includes implementation of security access rules governing user access. MCFD reduces the number of planned users and makes the use of ICM by MCFD optional, resulting in lower participation than initially planned (fewer than 25 users instead of 300).
April 2012	MSDSI implements Phase 2 on April 2, 2012, and focuses on basic case management for a number of programs in MSDSI and MCFD. This marks the start of ICM operating as the system for service delivery for those programs that moved to ICM from the Management Information System (MIS). A change in MCFD's practice model results in system redesign work and a more open-ended, but less tailored, solution for MCFD.

MSDSI – Ministry of Social Development and Social Innovation

MCFD – Ministry of Children and Family Development

MTICS – Ministry of Technology, Innovation and Citizens' Services

APPENDIX A: ICM PROJECT TIMELINE

Date	Event summary
July 2012	The Representative for Children and Youth (RCY) releases a public statement on July 19, 2012, highlighting concerns related to the implementation of ICM for MCFD, including the usability, accessibility and quality of information in the system (full report and related background available on the RCY website).
July 2012	MSDSI implements a minor system release (2.1) to introduce “corporate data warehouse, defect fixes and high priority enhancements”.
July 2012 to May 2013	MSDSI performs a detailed analysis in response to usability issues experienced by MCFD field workers, which subsequently results in Release 2.2 in September 2012 (see below). Additionally, MCFD hires more than 100 additional staff to support front-line workers while they receive training and transition to the new system.
August 2012	Deputy Minister for MCFD commissions an independent assessment to look at key issues, challenges and options for improving implementation of ICM for MCFD, including a review of good practices and computer systems from other jurisdictions. The assessment results in the Queenswood Reports (the interim report was completed in November 2012, and the final report was completed in July 2013, both available on the ICM website).
September 2012	MSDSI implements a major system release (2.2) on September 24, 2012, to address usability issues related to MCFD child welfare program, and to implement key elements of MSDSI’s policy reform for Income Assistance. The changes include improved client search and identification, and usability improvements. The cost of Release 2.2 is funded through “a supplemental and separate capital appropriation approved by Treasury Board”.
March 2013	MSDSI implements Phase 3 on March 4, 2013. Phase 3 focuses on deployment of the Bus Pass and Senior’s Supplement programs for MSDSI, and the initial implementation of the Service Provider Portal, including bringing onboard the “first wave” of service providers (e.g., childcare providers). The Portal allows service providers to view orders in ICM, create and submit invoices to ministry program areas (e.g., child care subsidy, autism, medical benefits) and verify payment information. MCFD case management is moved out of scope partway through the design for a number of program areas.
April 2013	ICM Project Board adjusts project scope to address critical issues related to ICM implementation for MCFD child welfare. In order to complete the project on time and on budget, the Project Board merges Phases 4 and 5 into a single phase and reduces the scope of ICM implementation. In particular, the shift in priority to support child welfare means there is insufficient budget to move programs completely off the legacy systems. The implementation timeline for Phase 4 (now the final phase of implementation) is December 2014, and the project capital budget remains unchanged at \$182 million.

APPENDIX A: ICM PROJECT TIMELINE

Date	Event summary
October 2013	Treasury Board accepts the Project Board's decision to reduce project scope to complete the project within the approved timeline and budget. This includes the decision to merge Phases 4 and 5 into a single phase and to remove the requirement to fully transition off MIS.
April 2014	ICM begins experiencing intermittent performance and connection issues. MSDSI coordinates a team of IT experts to troubleshoot the issues and stabilize the system, and limits the number of users accessing the system over several weeks.
November 2014	MSDSI implements Phase 4 on November 24, 2014, which marks the completion of the ICM project. Phase 4 involves implementing a number of enhancements, including an MCFD child welfare upgrade and MSDSI Channel Integration (client self-service), as well as implementing an enterprise data quality tool which provides increased search functionality for users and improved data quality management functionality for data stewards.

Source: Compiled by the Office of the Auditor General of British Columbia

APPENDIX B:

STATUS OF LEGACY SYSTEM REPLACEMENT

This section provides the status, at the time of project completion, of the 56 legacy systems identified for potential replacement by ICM. The ICM project team has indicated that there was not a firm commitment to replace each of the systems listed, but that this list represented potential candidates for replacement.

Legacy systems replaced (17)	
Ministry	System
MSDSI	BC Employment Program
	Bridging Employment Program
	Bus Pass
	Care Analysis and Tracking
	Client Transaction System
	Common System for Grants and Contributions
	Community Assistance Program
	Contact IV
	Employment Program for Persons with Disabilities
	Self-Service Application (Agent Dashboard)
	Senior Supplement
MCFD	After Hours
	After Hours Community Information System
	After Hours Operational Reporting
	Child Care Subsidy
	Child Care Subsidy Evaluator
	Reportable Circumstances Templates
Legacy systems partially replaced (5)	
Ministry	System
MSDSI	Complaint Tracking System
	Fraud Allegation Reporting
	Management Information System (MIS)
MCFD	Autism and Medical Benefits Analysis Tracking
	Intake and Child Services (MIS SWS)

MSDSI – Ministry of Social Development and Social Innovation

MCFD – Ministry of Children and Family Development

MTICS – Ministry of Technology, Innovation and Citizens' Services

APPENDIX B: STATUS OF LEGACY SYSTEM REPLACEMENT

Legacy systems not replaced (34)	
Ministry	System
MSDSI	Advocate Call Management System
	CLBC Templates
	File Review and Distribution
	Prevention and Loss Management Services System
	Primary Access Regional Information System (PARIS)
MCFD	Aboriginal Case Practice Audit Tool
	Adoption Management System
	Adoption Reunion Registry
	Birth Father Registry
	Brief Child and Family Phone Interview
	CARIS Reader
	Child Tax Benefit
	Community Information System – Helpline
	Community and Residential Information System (CARIS)
	Contract Writing Tool
	Customer Call Management System
	Department of Indian Affairs and Northern Development System
	Delegation Management System
	Early Childhood Educator Registry
	Family Group Conferencing
	Integrated Case Practice Audit Tool
	Integrated Practice Analysis Tool
	Management and Reporting System
	Online Healthware Reader
	Person Registry Web Services
	Post Adoption Assistance for Adoption Services
	Post Adoption Openness
	RAP Templates
Report Distribution System	
Resource and Payment (RAP) System	
Security Registry Web Services	
Service Registry Web Services	
Word Template System	
MTICS	Remedy (replacement of MSDSI/MCFD use only)

Source: Compiled by the Office of the Auditor General of British Columbia



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