

**REPORT OF THE REVIEW INTO THE PUBLIC DISCLOSURE OF
FULL NRIC NUMBERS ON BIZFILE PEOPLE SEARCH**

25 February 2025

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Executive Summary

1. The disclosure of full National Registration Identity Card (“NRIC”) numbers in the *People Search* function of the Accounting and Corporate Regulatory Authority’s (“ACRA”) new Bizfile portal from 9 to 13 December 2024 caused public anxiety and concerns (“the Bizfile incident”). The Government set up a Panel to (a) review the Government’s policy on the responsible use of NRIC numbers where it pertained to the Bizfile portal, (b) determine what led to the Bizfile incident, and (c) identify learning points so that similar incidents do not recur.

2. The Panel found several shortcomings by both ACRA and the Ministry of Digital Development and Information (“MDDI”) in this incident.

BACKGROUND AND CONTEXT

3. The NRIC number is intended to be used as a unique identifier when required by law or for accurate identification. Hence, it has to be disclosed to others when needed. However, some organisations started incorrectly using NRIC numbers for authentication.¹ The use of partial NRIC numbers² also became more prevalent.³ Partial NRIC numbers gave some organisations and individuals a false sense of security, and their prevalent use created the impression that the full NRIC number should be kept secret. (See [Annex](#) for further details on the issues regarding the use of full and partial NRIC numbers.)

4. In late 2022, the former Smart Nation and Digital Government Office (“SNDGO”),⁴ which is now part of MDDI, started reviewing the policy on the use of NRIC numbers. The policy intent was to return NRIC numbers to their proper use as unique identifiers by stopping the incorrect use of NRIC numbers for authentication, and moving away from the use of partial NRIC numbers. This was a complex undertaking that would take time, and require a significant shift away from current norms and practices in how NRIC numbers are used.

5. The Ministers overseeing SNDGO were responsible for deciding the policy direction on the use of NRIC numbers. For example, the Ministers endorsed the policy intent of returning NRIC numbers to their proper use as unique identifiers, and the broad implementation approach to do so.

¹ Authentication refers to the process where an individual proves who he or she claims to be, to access privileged information or resources.

² In this report, the words “partial NRIC number” will be used synonymously with “masked NRIC number” (or its variations) i.e. showing 123A or SXXXX123A. The report will only use “masked” (or its variations) when referring specifically to MDDI’s July 2024 Circular Minute and correspondence between agencies.

³ In 2018, the Personal Data Protection Commission issued Advisory Guidelines stating that organisations should only collect, use or disclose full NRIC numbers when it is required by law or needed for identification to a high degree of fidelity. The Advisory Guidelines recognised that organisations may collect partial NRIC numbers where other alternatives were unsatisfactory. The public sector introduced similar guidelines as well.

⁴ SNDGO merged with then-Ministry of Communications and Information (“MCI”) on 1 April 2024. MCI was renamed as MDDI on 8 July 2024. This report refers to “SNDGO” in relation to events that happened before 1 April 2024, and to “MDDI” in relation to events thereafter.

6. The Permanent Secretaries of SNDGO (and subsequently MDDI) had overall responsibility for the implementation plans in accordance with the guidance from the Ministers. SNDGO/ MDDI planned for the public sector to take the lead on both (a) stopping the use of NRIC numbers for authentication and (b) moving away from the use of partial NRIC numbers, and worked out the sequence and timing of changes in the public sector. It also developed plans for public education and private sector engagements on the proper use of NRIC numbers and risks of using partial NRIC numbers.

7. Meanwhile, ACRA had been working with its IT vendor to develop the new Bizfile portal since 2022. As the national regulator for business registration and financial reporting, ACRA is empowered by legislation to provide access to information on business entities and their associated individuals, and does so through the Bizfile portal.

8. ACRA's Chief Executive⁵ chaired the agency's Steering Committee for the new Bizfile portal, and had overall responsibility for the portal's design and implementation. *People Search* is a function for Bizfile users to search for and select the individuals associated with registered business entities whose information they wish to access through the purchase of a *People Profile*. The *People Search* function had displayed full NRIC numbers in its search results before 2016, and partial NRIC numbers from 2016 until the new Bizfile portal was launched on 9 December 2024.

KEY EVENTS

9. SNDGO developed a phased implementation plan for the changes in the public sector. In September 2023, SNDGO required public agencies to stop (i.e. not introduce) new uses of NRIC numbers for authentication, and provide information to SNDGO on the effort and time required to stop existing uses of NRIC numbers for authentication.

10. In early 2024, separate from SNDGO's review of the public sector's use of NRIC numbers, ACRA proposed to change the *People Profile* in the Bizfile portal to display partial NRIC numbers, instead of its long-standing practice of displaying full NRIC numbers. Upon hearing of ACRA's plan, SNDGO advised ACRA on SNDGO's broad policy direction to return NRIC numbers to their proper use as identifiers, and that SNDGO was working towards stopping public agencies' use of NRIC numbers for authentication and partial NRIC numbers. In view of this exchange and taking into account Bizfile users' feedback that full NRIC numbers are necessary for corporate transparency, ACRA decided not to proceed with its proposed change to *People Profile*.

11. In July 2024, MDDI issued a Circular Minute ("July 2024 CM") that required public agencies to:

- a. Stop using NRIC numbers for authentication purposes;
- b. Not use masked NRIC numbers internally;⁶

⁵ There was a change in ACRA's senior leadership in 2024, with a new Chief Executive taking over the role on 22 April 2024.

⁶ This referred to the use of partial NRIC numbers within the public sector.

- c. Stop any planned use⁷ of masked NRIC numbers e.g. in new business processes or digital products; and
- d. Provide information to MDDI on the agencies' existing uses of masked NRIC numbers in communications or correspondence with the public.

12. In mid-July 2024, MDDI briefed more than 80 agencies (including ACRA) and answered their questions on the July 2024 CM. The video recording of the briefing and MDDI's replies to agencies' Frequently Asked Questions ("FAQ document") were disseminated to agencies afterwards.

13. ACRA subsequently sought email clarifications from MDDI on how the July 2024 CM applied to the display of NRIC numbers in the search results of *People Search* of the new Bizfile portal.

14. However, both agencies did not realise that their communications still left a gap in understanding. On 9 December 2024, ACRA launched the new Bizfile portal with *People Search* results displaying full NRIC numbers. After the Government received feedback on the public concerns, the *People Search* function was disabled on the night of 13 December 2024.

KEY FINDINGS

15. The Panel affirmed the policy intent to return NRIC numbers to their proper use as unique identifiers by stopping the incorrect use of NRIC numbers for authentication, and moving away from the use of partial NRIC numbers. Doing so would better protect our citizens. The Panel also affirmed that the public sector should take the lead, as it would take time to consult, educate and engage the private sector.

16. The Panel found that a confluence of several shortcomings, which agencies would need to learn from, led to the Bizfile incident.

Shortcoming #1 – MDDI should have been clearer in its policy communications in its July 2024 CM. MDDI and ACRA staff did not realise that ACRA had misunderstood how the July 2024 CM applied to the new Bizfile portal.

17. ACRA and MDDI had two key misunderstandings over the July 2024 CM:

- a. **Whether the July 2024 CM applied to the *People Search* function in the new Bizfile portal.** The July 2024 CM required agencies to stop "any planned use of masked NRIC numbers, e.g. in ***new*** [emphasis added] business processes or digital products". MDDI's intent was for agencies to stop any plans to introduce ***new use cases*** of partial (or masked) NRIC numbers (i.e. use cases introduced for the first time by agencies). This was partly influenced by ACRA's proposal in early 2024 to change to displaying partial instead of full NRIC numbers in its *People Profile*. However, ACRA misinterpreted that this requirement applied to the *People Search* function in its ***new***

⁷ MDDI used the term "planned use" to mean that agencies should not introduce new use cases of partial NRIC numbers, for both internal and external-facing uses.

Bizfile portal. This was not MDDI's intention as *People Search* was an existing rather than new use case.

- b. **How to stop the use of partial (or masked) NRIC numbers where these had previously been used.** Stopping the use of partial (or masked) NRIC numbers did not mean using full NRIC numbers in every case. However, ACRA, which was influenced by its early 2024 exchange with SNDGO where it was alerted to the impending policy change on use of full NRIC numbers, interpreted that it was a requirement to switch to full NRIC numbers. In that exchange, ACRA had used the term "unmasking" to summarise its understanding of SNDGO's policy intent. This misinterpretation had not been corrected by SNDGO.

18. These misunderstandings arose because MDDI's July 2024 CM did not explain key terms like "planned use" clearly, and did not explain that stopping the use of partial NRIC numbers did not mean showing full NRIC numbers in every case. Although MDDI's briefing (which was recorded) and FAQ document helped to clarify these issues, these documents were not appended to the July 2024 CM. While ACRA received these documents, the documents were not disseminated adequately within ACRA, such as to the project leads for the new Bizfile portal.

19. In email exchanges on the July 2024 CM, ACRA and MDDI officers also did not sufficiently engage each other on the specifics which would have clarified the misunderstandings. In particular, both sides had used the term "unmasking", but with different understanding of what it entailed. Both agencies also did not appreciate the need to discuss this matter in depth, even though it involved a major public registry.

Shortcoming #2 – There were internal shortcomings within ACRA in sharing and acting on the information from MDDI on the July 2024 CM.

20. ACRA did not disseminate the information from MDDI's briefing materials and FAQ document on the July 2024 CM internally, to the project leads for the new Bizfile portal and ACRA senior leadership. This contributed to ACRA acting on incomplete information when it decided to disclose full NRIC numbers in the *People Search* function of the new Bizfile portal.

Shortcoming #3 – MDDI should have paid more attention to the implementation plan for new use cases of partial NRIC numbers that were more complex, such as public registries.

21. In its implementation plan for agencies to stop introducing new use cases of partial NRIC numbers, MDDI did not differentiate between simpler use cases like one-to-one correspondence between public agencies and members of the public, and more complex use cases like public registries which could potentially disclose a large amount of data to third parties performing searches. The *People Search* function belonged to the latter category. While MDDI had planned to accord greater attention and detailed policy guidance to existing use cases of greater complexity, it should have done the same for new use cases, which ACRA thought the new Bizfile portal's *People Search* function fell under.

Shortcoming #4 – In deciding to disclose full NRIC numbers in People Search, ACRA did not first assess the proper balance between sharing full NRIC numbers and ensuring that they were not too readily accessible. This contravened the Government’s internal rules on data management.

22. ACRA had layered what it understood to be the requirements of the July 2024 CM onto its existing system design, and did not adequately consider alternative designs of the *People Search* function (e.g. requiring users to key in additional search parameters, such as the Unique Entity Number of the associated business entity). The design of the *People Search* function of the new Bizfile portal launched on 9 December 2024 meant that individuals’ full NRIC numbers were made too easily available to those who were improperly using the *People Search* function in a way that went beyond its intended purpose.

23. ACRA did not first assess the proper balance between the public interest in sharing full NRIC numbers, which was to promote corporate transparency; and the competing public interest in ensuring that full NRIC numbers were not too readily accessible, since they were still personal data which many viewed as sensitive information, before deciding to disclose full NRIC numbers in the search results of *People Search*. This was a contravention of the Government’s Instruction Manual on Information Communications Technology & Smart Systems Management (“IM8”),⁸ which ACRA was, as a public agency, required to comply with under the Public Sector (Governance) Act 2018 (“PSGA”).

24. The Panel noted that the incident took place before public education and engagement had begun on the proper use of NRIC numbers as a unique identifier. This exacerbated public concerns when full NRIC numbers were easily searchable and accessible in the *People Search* function. The Panel was of the view that it would have been better for MDDI to have embarked on public education and engagement earlier than what it had planned.

Shortcoming #5 – Certain security features for the People Search function were not adequately implemented.

25. ACRA had required the IT vendor to implement various security features in the *People Search* function of the new Bizfile portal to protect against unintended uses by, for instance, limiting the extent of searches allowed. However, certain security features were not adequately implemented when the new Bizfile portal was launched on 9 December 2024. The IT vendor was also required to ensure that web application penetration tests were conducted prior to the launch, but the report submitted to ACRA did not indicate any issues with the *People Search* function. ACRA only found out that certain security features were not adequately implemented after it commissioned GovTech to perform a security review on 14 December 2024. ACRA is following up with the vendor and considering all its available options. Without prejudice to any such options, the Panel notes that ACRA remains ultimately accountable for the implementation of the *People Search* function, even though it had contracted this to its IT vendor. ACRA is also reviewing its implementation of Bizfile.

⁸ The Government’s Instruction Manuals codify policies, standards and instructions for the proper functioning of the Public Service. IM8 applies to all public agencies pursuant to the PSGA, and among other things, governs the management of data, including how agencies collect, use and disclose data.

Shortcoming #6 – The incident management after public concerns on the new Bizfile portal surfaced on 12 December 2024 should have been better.

26. Upon receiving the public feedback, ACRA and MDDI should have ascertained more quickly the key facts of how the Bizfile incident happened, and ACRA should have disabled the *People Search* function sooner. Doing so would have addressed public concerns in a more timely manner.

27. The public communications and response to public concerns should also have been better coordinated and clearer. In hindsight, the Government should have made clear to the public at the outset that moving away from the use of partial NRIC numbers did not automatically mean using full NRIC numbers in every case, or disclosing them on a large scale.

NEXT STEPS

28. While the Panel did not find any factual evidence of deliberate wrongdoing or wilful inaction by the MDDI and ACRA officers involved in this incident, the shortcomings, including ACRA's contravention of IM8, identified by the Panel should have been avoided. The Public Service Division, MDDI and ACRA will follow up to review the actions and responsibilities of the relevant individual officers. This will be conducted in accordance with the applicable accountability and disciplinary frameworks and processes in the respective public agencies involved.

29. This review contains important lessons for the Public Service. The lessons that the Panel had identified will be disseminated across the whole of the Public Service, so that agencies can take these on board and similar incidents do not recur.

Section 1: Introduction

1. On 9 December 2024, the Accounting and Corporate Regulatory Authority (“ACRA”) launched its new Bizfile portal. *People Search* was a function on the portal that allowed users to search for and select the individuals associated with registered business entities whose information they wished to access through the purchase of a *People Profile*. The *People Profile* would include details such as the individual’s associated business entities and full National Registration Identity Card (“NRIC”) number.

2. Unlike the old Bizfile portal, which showed partial¹ NRIC numbers in the *People Search* results, the new Bizfile portal displayed full NRIC numbers. The disclosure of full NRIC numbers in the *People Search* function of ACRA’s new Bizfile portal from 9 to 13 December 2024 caused public anxiety and concerns (“the Bizfile incident”). Therefore, the *People Search* function was disabled on the night of 13 December 2024.

1.1 Panel for the review

3. The Government set up a Panel to (a) review the Government’s policy on the responsible use of NRIC numbers where it pertained to the Bizfile portal, (b) determine what led to the Bizfile incident, and (c) identify learning points so that similar incidents do not recur. The Panel also reviewed the design and implementation of the *People Search* function, as well as the response by ACRA and the Ministry of Digital Development and Information (“MDDI”) to the incident from when public concerns arose on 12 December 2024 until the *People Search* function was disabled on 13 December 2024.

4. This review was not a disciplinary process. While the Panel’s report serves as a reference, any disciplinary action, if warranted, in relation to individual officers will be conducted in accordance with the applicable frameworks and processes in the respective public agencies involved.

Composition of the Panel

5. The Panel was chaired by Head, Civil Service, Mr Leo Yip, and comprised the following Permanent Secretaries of Ministries not involved in the matters being reviewed:

- a. Permanent Secretary (Home Affairs), Mr Pang Kin Keong;
- b. Permanent Secretary (Defence), Mr Chan Heng Kee; and
- c. Permanent Secretary (Social and Family Development), Mr Aubeck Kam.

6. It also included Permanent Secretaries overseeing the Ministry of Finance (“MOF”) and MDDI, as both Ministries needed to thoroughly review the incident and their internal processes, and implement the learning points from the review. These Permanent Secretaries were:

¹ In this report, the words “partial NRIC number” will be used synonymously with “masked NRIC number” (or its variations) i.e. showing 123A or SXXXX123A. The report will only use “masked” (or its variations) when referring specifically to MDDI’s Circular Minute that was issued in July 2024 and correspondence between agencies.

- a. Permanent Secretary (Finance), Mrs Tan Ching Yee;
- b. Permanent Secretary (Digital Development and Information), Mr Joseph Leong;
- c. Permanent Secretary (Development), MOF, Mr Lai Chung Han; and
- d. Second Permanent Secretary (Smart Nation), Prime Minister's Office, Mr Augustin Lee.

7. The Panel reported to Senior Minister and Coordinating Minister for National Security Mr Teo Chee Hean, who is Minister-in-charge of the Smart Nation Group, and Digital Government and Public Sector Data Governance. The Panel submitted its report to Senior Minister Teo, who in turn, submitted it to the Prime Minister.

Approach to the review

8. In the first stage of the review, ACRA and MDDI conducted their own internal reviews, submitted their findings and learning points to the Panel, and responded to the Panel's queries on their submissions. In the second stage, the Panel interviewed MDDI officers who were involved in the NRIC policy review as well as ACRA officers implementing the new Bizfile portal. The Panel also reviewed relevant documents such as the correspondence between ACRA and MDDI officers, and documents related to the guidance and instructions that MDDI issued to agencies regarding the use of NRIC numbers in the public sector. In addition, the Panel was briefed on the design and implementation of the *People Search* function of the new Bizfile portal.

Section 2: Background

2.1 How the public sector governs its use of Information Communications Technology & Smart Systems

9. The Government’s Instruction Manuals (“IMs”) codify policies, standards and instructions for the proper functioning of the Public Service. Before 1 April 2024, the Smart Nation and Digital Government Office (“SNDGO”) oversaw Information Communications Technology & Smart Systems (“ICT&SS”) policies and digital transformation in the Singapore public sector, and was therefore in charge of the IM on ICT&SS Management (“IM8”). From 1 April 2024, this function was taken over by the new Smart Nation Group² in MDDI. This report refers to “SNDGO” in relation to events that happened before 1 April 2024, and to “MDDI” in relation to events thereafter.

10. Pursuant to the Public Sector (Governance) Act 2018 (“PSGA”), all public agencies must comply with IM8, which, among other things, governs the management of data, including how agencies collect, use and disclose data. The public sector’s personal data protection standards in the PSGA and IM8 are aligned with the Personal Data Protection Act 2012 (“PDPA”), but have been adapted to the public service context.

11. Under IM8, public agencies are required to set up governance structures to manage and use data securely within their agencies, and to comply with the data management policies and standards set out in IM8.

12. MDDI may issue Circular Minutes (“CMs”) on ICT&SS, which typically provide directives of a temporary nature until they are superseded or incorporated into the next revision of the IM. Public agencies must comply with instructions in both the IM and CMs, which are to be read together. For MDDI, the two Permanent Secretaries responsible for Smart Nation matters both oversee the issuance of the relevant IM and CMs.

2.2 Role of ACRA and the Bizfile portal

13. One of ACRA’s roles as the national regulator of business registration and financial reporting is to maintain a national business register. ACRA is empowered by legislation to collect and provide access to basic information on business entities and their associated individuals,³ like other business registries around the world. This enhances corporate transparency, facilitates business transactions, and guards against illicit activities.

² The Smart Nation Group was formed on 1 April 2024 when SNDGO merged with the digital development functions of then-Ministry of Communications and Information (“MCI”). MCI was renamed as MDDI on 8 July 2024.

³ Associated individuals are individuals who are associated with any ACRA-registered entity. They include owners of businesses, directors of companies, or shareholders of private companies.

14. Bizfile is ACRA's online portal for business registration, filing of annual returns, and accessing information on business entities and their associated individuals.

- a. Users can use the free **People Search function** to search for individuals associated with ACRA-registered entities by keying in their full or partial names.
- b. After identifying the individual of interest from the search results, users can purchase that individual's **People Profile**, which contains information such as the individual's full name, full NRIC number, contact address, associated businesses, and past and present positions held.
- c. Bizfile does not contain the NRIC numbers of all Singapore citizens. It only has information pertaining to ACRA-registered entities and associated individuals who are reflected in the entities' filings or lodgements to ACRA.

Section 3: Operating Context and Brief Chronology

3.1 Broader policy on responsible use of NRIC numbers

Overview

15. The NRIC number is a unique and permanent identifier issued by the Government to Singapore citizens and permanent residents. As each individual holds only one NRIC number that is unique, NRIC numbers support effective public administration in instances that require the accurate identification of individuals. For example, NRIC numbers can ensure that government benefits are disbursed to the correct recipient and can prevent individuals from using a different name or address to receive the same benefit more than once. Some private sector organisations are also required by law to collect NRIC numbers, such as during registration for a new phone line, to ensure traceability of who is operating the phone line.

16. Over time, the collection, use and disclosure of full NRIC numbers became widespread, including in situations that did not require NRIC numbers (e.g. lucky draws).

17. To address this, in 2018, the Personal Data Protection Commission (“PDPC”) issued Advisory Guidelines⁴ which stated that organisations should only collect, use or disclose full NRIC numbers when (a) required under the law (or when an exception under the PDPA applies); or (b) necessary to establish or verify the identity of individuals to a high degree of fidelity (i.e. high accuracy). Like the PDPA, IM8 requires public agencies to minimise collection, use and disclosure of personal data like NRIC numbers to what is necessary, and to evaluate the basis for collecting and using personal data in each use case.

18. In lieu of full NRIC numbers, the collection and use of partial NRIC numbers became more prevalent in both the private and public sectors.

- a. PDPC’s Advisory Guidelines recognised that organisations may collect partial NRIC numbers when other alternatives (e.g. organisation or user-generated IDs) were unsatisfactory.
- b. In the public sector, before MDDI started instructing⁵ agencies in 2024 to move away from the use of partial NRIC numbers, partial NRIC numbers were also used as one of the alternatives when full NRIC numbers were not needed.

⁴ “Advisory Guidelines on the Personal Data Protection Act for NRIC and other National Identification Numbers”, Personal Data Protection Commission, August 31, 2018, <https://www.pdpc.gov.sg/-/media/files/pdpc/pdf-files/advisory-guidelines/advisory-guidelines-for-nric-numbers---310818.pdf>.

⁵ This refers to the CM that MDDI issued in July 2024, which was also the source of a misunderstanding between ACRA and MDDI that contributed to the Bizfile incident. This is further elaborated on in Section 4.2.

Policy direction

19. In late 2022, SNDGO started reviewing the policy on the use of NRIC numbers, with the aim of returning NRIC numbers to their proper use as unique identifiers. SNDGO realised that:

- a. **First, NRIC numbers were being used incorrectly for authentication.** Some organisations were using NRIC numbers as an authenticator for access to privileged information or services. This was a risk as full NRIC numbers are not secret. The proper use of the full NRIC number as an identifier means that it has to be disclosed to other people and organisations when needed.
- b. **Second, the use of partial NRIC numbers gave some organisations and individuals a false sense of security.** The prevalent use of partial NRIC numbers also created the impression that the full NRIC number should be kept secret.

Further details on the issues regarding the use of full and partial NRIC numbers are in [Annex](#).

20. SNDGO discussed the policy review with the supervising Ministers for SNDGO, who endorsed the policy intent of returning NRIC numbers to their proper use as unique identifiers. In the first half of 2023, the Ministers also endorsed the broad implementation approach, namely:

- a. To start by addressing the incorrect use of NRIC numbers for authentication, before tackling the use of partial NRIC numbers;
- b. The public sector should take the lead on stopping the use of NRIC numbers for authentication, as the private sector would take longer to make the shift; and
- c. There should be public education efforts to communicate the public sector's move to stop the incorrect use of NRIC numbers for authentication, so as to raise public awareness and change practices.

3.2 ACRA's development of the new Bizfile portal

21. Meanwhile, in 2022, ACRA started developing a new Bizfile portal with improved functionality for users. As head of the agency, ACRA's Chief Executive ("CE")⁶ chaired the agency's Steering Committee for the new Bizfile portal, and had overall responsibility for the new portal's design and implementation. An IT vendor was contracted to develop the new Bizfile portal.

22. The functions to search for and purchase information on individuals (i.e. *People Search* and *People Profile*) have been available on Bizfile since 2003, but the way *People Search* results are displayed has evolved over time. Before 2016, *People Search* results showed names with the corresponding full NRIC numbers. This was before the issuance of PDPC's Advisory Guidelines in 2018, after which the public and private sectors took steps to minimise collection, use and disclosure of full

⁶ There was a change in ACRA's senior leadership in 2024, with a new CE taking over the role on 22 April 2024.

NRIC numbers. In January 2016, the full NRIC numbers in *People Search* results were replaced with partial NRIC numbers on the advice of then-Infocomm Development Authority. When ACRA started developing the new Bizfile portal, it had intended for the *People Search* function in the new Bizfile portal to work similarly to the old Bizfile portal, i.e. display partial NRIC numbers alongside the corresponding names in the search results.

3.3 Chronology of key events related to the incident

23. This section provides an overview of the key events related to the Bizfile incident. Subsequent sections of this report will cover these events in greater detail, along with the Panel’s findings.

Date	Event
August 2022 onwards	SNDGO started reviewing the policy on use of NRIC numbers.
September 2023	SNDGO issued a CM that required agencies to (a) stop new uses of NRIC numbers for authentication, and (b) provide information to SNDGO on the effort and time required to stop existing uses of NRIC numbers for authentication.
February 2024	<p>ACRA proposed to change its <i>People Profile</i>, which had been showing individuals’ full NRIC numbers, to display partial NRIC numbers instead.</p> <p>SNDGO advised ACRA of its broad policy direction to return NRIC numbers to their proper use as unique identifiers, and that it was working towards stopping public agencies’ use of (a) NRIC numbers for authentication and (b) partial NRIC numbers. In view of the exchange with SNDGO, and Bizfile users’ feedback that full NRIC numbers are necessary for corporate transparency, ACRA decided not to proceed with its proposed change to <i>People Profile</i>.</p>
5 July 2024	<p>MDDI issued another CM (“July 2024 CM”) to all public agencies, including ACRA.</p> <p>As this CM was the source of a misunderstanding between ACRA and MDDI which contributed to the Bizfile incident, it will be examined in greater detail in Section 4.</p>
16 July 2024	MDDI conducted a virtual briefing for agencies’ data governance teams, to explain the July 2024 CM and address queries. Two ACRA officers attended the briefing.
17 July 2024	MDDI emailed all agencies’ data governance teams with the video recording of the 16 July 2024 briefing, and a document with MDDI’s responses to common questions that agencies had raised on the July 2024 CM. ACRA’s data governance team received the email.
5 July to early August 2024	After the issuance of the July 2024 CM, ACRA had the misunderstanding that the July 2024 CM required them to show full NRIC numbers in the <i>People Search</i> function of the new Bizfile portal.

Date	Event
	<p>ACRA then had internal deliberations about the risks of showing full NRIC numbers in the <i>People Search</i> function, including concerns relating to personal data protection, and sought clarification from MDDI on how the July 2024 CM should apply to ACRA's new Bizfile portal.</p> <p>Ultimately, ACRA misunderstood that the July 2024 CM required them to show full NRIC numbers in the <i>People Search</i> function of the new Bizfile portal.</p>
17 August 2024	ACRA instructed the IT vendor to implement the requisite system changes to show full NRIC numbers in the <i>People Search</i> function of the new Bizfile portal, which was slated for launch near the end of 2024.
9 December 2024	ACRA launched the new Bizfile portal, with full NRIC numbers displayed in the search results of <i>People Search</i> .
12 December 2024	Agencies began receiving feedback from members of the public and media queries on the <i>People Search</i> function.
13 December 2024	ACRA and MDDI issued media statements to address public concerns and media queries. The <i>People Search</i> function was disabled on the night of 13 December 2024.
19 December 2024	MDDI, MOF and ACRA held a press conference to apologise for the anxiety caused and to explain what had happened.
28 December 2024	A revised <i>People Search</i> function was introduced on the new Bizfile portal, without NRIC numbers displayed in the search results.

3.4 Panel's observations

Broader policy on responsible use of NRIC numbers

24. **The Panel affirmed the policy intent to return NRIC numbers to their proper use as unique identifiers** by stopping the incorrect use of NRIC numbers for authentication and moving away from the use of partial NRIC numbers. Doing so would better protect our citizens. The Panel also affirmed the need for the public sector to take the lead, as it would take time to consult, educate and engage the private sector to make these shifts.

25. The Panel also noted that the broader policy on responsible use of NRIC numbers reflects some of the complexities posed as Singapore progresses as a digital society. As digital services and processes become increasingly prevalent, issues relating to these digital services, such as data protection and cybersecurity, have been brought to the forefront. In response, we as a society will need to change some prevailing norms, practices and policies, such as how we use and regard NRIC numbers. This requires an extensive public education and communications effort.

What led to the incident

26. The Panel was mindful that in examining the causes and contributory factors of the incident, it needed to review not just the most proximate events but also other events that occurred upstream. This was necessary to comprehensively identify lessons that the public sector should learn from.

27. The Panel recognised that in the vast majority of cases, policies in the public sector are accurately communicated and interpreted, and successfully implemented by agencies.

28. In this case, the Panel found that a confluence of several shortcomings on the part of both MDDI and ACRA, and how the two agencies interacted on the use of NRIC numbers, led to the Bizfile incident.

Section 4: Policy Implementation and Communication

29. This section examines MDDI’s implementation plan for the policy on responsible use of NRIC numbers, including how MDDI communicated its July 2024 CM on this issue, how ACRA understood it, and how the misunderstandings between ACRA and MDDI occurred.

4.1 Events from September 2023 to July 2024

30. The Permanent Secretaries of SNDGO had overall responsibility for implementing the policy in accordance with the policy intent and broad implementation approach as guided by the supervising Ministers for SNDGO. As mentioned in Section 3.1, the endorsed broad implementation approach was: (a) to start by addressing the incorrect use of NRIC numbers for authentication, before tackling the use of partial NRIC numbers, (b) for the public sector to take the lead on stopping the use of NRIC numbers for authentication, and (c) to have public education efforts to communicate the public sector’s move to stop the use of NRIC numbers for authentication.

31. The SNDGO team working on government data policies planned for the public sector to take the lead on both (a) stopping the use of NRIC numbers for authentication, and (b) moving away from the use of partial NRIC numbers. They planned to implement the changes for the public sector in a step-by-step approach, starting with stopping the use of NRIC numbers for authentication. Issuing CMs is a common method for SNDGO to inform public agencies of changes in ICT&SS policies. All public officers can access issued CMs via a central Intranet portal.

32. In September 2023, SNDGO issued a CM that required public agencies to stop (i.e. not introduce) new uses of NRIC numbers for authentication, and provide information to SNDGO on the effort and time required to stop existing uses of NRIC numbers for authentication.

Discussions on ACRA’s legislative changes in February 2024

33. In February 2024, separate from SNDGO’s review of the public sector’s use of NRIC numbers, ACRA was finalising proposals for changes to its legislation, ahead of plans to table the proposed amendments in Parliament in May 2024. One of the proposals was for ACRA to display partial NRIC numbers in the paid *People Profile*, which had all along showed full NRIC numbers. When SNDGO found out about this proposal, it advised ACRA that SNDGO was reviewing the use of NRIC numbers in the public sector. The broad policy direction was to return NRIC numbers to their proper use as identifiers. SNDGO also informed ACRA that it was working towards stopping public agencies’ use of (a) NRIC numbers for authentication and (b) partial NRIC numbers, and that it would be issuing guidance to agencies later in the year.

34. After the discussion, ACRA sent a summary of their understanding to SNDGO for confirmation. In the summary, ACRA conveyed its understanding that SNDGO’s policy intent was for public agencies to “unmask” NRIC numbers. SNDGO did not correct ACRA that SNDGO’s intent to stop the use of partial NRIC numbers did not mean that all partial NRIC numbers would be “unmasked” and shown as full

NRIC numbers. This contributed to the subsequent misunderstandings between ACRA and MDDI in July 2024.

35. In view of the exchange with SNDGO, and Bizfile users' feedback that full NRIC numbers are necessary for corporate transparency, ACRA dropped its proposal to show partial NRIC numbers in *People Profile*. At the same time, SNDGO realised that its implementation plan needed to cater for agencies that were planning to introduce new use cases of partial NRIC numbers.

MDDI's phased implementation approach

36. After the September 2023 CM, the next steps of MDDI's phased implementation approach were for public agencies to stop all uses of NRIC numbers for authentication, and to move away from the use of partial NRIC numbers.

37. MDDI planned to instruct agencies to move away from the use of partial NRIC numbers in phases, depending on (a) whether the use case was an internal use of partial NRIC numbers within the public sector, or an external-facing one (e.g. with members of the public, or the private sector), and (b) whether the use case was an existing or new use case.

- a. **MDDI planned to stop existing internal uses of partial NRIC numbers within the public sector first** (e.g. data sharing between public agencies for inter-agency coordination and service delivery).
- b. **For existing external-facing uses of partial NRIC numbers**, MDDI planned to collect information on agencies' use cases, so as to assess and develop plans on when and how to stop these uses. Its preliminary plan was to stop the existing uses of partial NRIC numbers in one-to-one communications with the public, before addressing other types of correspondence that the public sector had with the public.
- c. **MDDI planned to stop public agencies from introducing new uses of partial NRIC numbers, whether internal or external-facing**. This was to avoid adding to the use of partial NRIC numbers beyond existing uses (e.g. ACRA's proposal to use partial NRIC numbers for *People Profile* in February 2024).

MDDI subsequently implemented and communicated this plan by issuing a CM in July 2024 to public agencies. The Panel's findings on how this plan was communicated are elaborated in Sections 4.2 to 4.5.

38. MDDI also planned to commence public education and private sector engagements on the proper use of NRIC numbers and risks of using partial NRIC numbers after the public sector itself had stopped the use of NRIC numbers for authentication. The public education and private sector engagement plans were developed by PDPC and the MDDI team working on government data policies.

39. MDDI intended to next seek guidance from its supervising Ministers in early 2025 on its plans for (a) public education and consultation, and (b) stopping the public sector's existing uses of partial

NRIC numbers in one-to-one communications with members of the public. Implementation of these plans were slated to commence later in 2025. However, the Bizfile incident interrupted these plans.

4.2 Issuance of the July 2024 CM and clarification efforts

40. On 5 July 2024, the MDDI team working on government data policies issued a CM that required agencies to: (a) stop the use of NRIC numbers for authentication, and stop internal uses of masked NRIC numbers within the public sector, with effect from 1 November 2024; and (b) not introduce any planned (i.e. new) uses of masked NRIC numbers, both internally and externally, with immediate effect. This July 2024 CM was also emailed to senior Public Service leaders, including those with key responsibilities in IT and data matters within their agencies.

41. The table below reproduces the relevant paragraphs of the CM:

July 2024 CM [Bold and <u>underlined</u> text are as they appear in the original CM. Comments that are not part of the CM are indicated in <i>italics</i> .]	
	(...)
	Revised Measures to be Implemented by Agencies
5	With effect from 1 November 2024, all Agencies are to: <ul style="list-style-type: none">a. Use NRIC numbers only as identifiers to uniquely identify individuals;b. Stop using NRIC numbers for authentication purposes.c. Agencies that have been using NRIC as passwords for authentication, must first determine if authentication is even required in the first place. If required, then: <i>(...) [Note: the CM goes on to list alternative authentication methods.]</i>
	(...)
7	Additionally, with effect from 1 November 2024, no Agency is allowed to use masked NRIC numbers internally. This includes when sharing data with other agencies. Agencies are also to <u>immediately cease any planned use of masked NRIC numbers, e.g. in new business processes or digital products.</u>
	Upcoming Steps in Review of NRIC Numbers
8	In addition to the above guidelines, the Smart Nation Group (SNG) is planning for Agencies [<i>sic</i>] cease the use of masked NRIC numbers in public correspondence. This is the next step towards returning NRIC numbers to be used purely as identifiers.
9	Agencies will soon be required to stop using masked NRIC numbers in <u>one-to-one Government communications with members of public (i.e. including emails, hardcopy</u>

correspondences and short message services). To assist in this rollout, all Agencies are to provide the following information (...)

[Note: The CM asked agencies to provide MDDI with a list of their existing communications or correspondence with members of the public that used masked NRIC numbers. Agencies were asked to indicate how long they would need to stop using masked NRIC numbers in these existing external-facing uses, and their operational challenges and cost considerations in doing so.]

Public Education Efforts

10 SNG will be working with the Personal Data Protection Commission to educate the public on the proper use of NRIC numbers solely as unique identifiers and the broader shift away from masked NRIC numbers. These public education efforts will likely take place after 1 November 2024 when all Agencies are fully compliant with this Circular Minute.

42. Generally, the agency issuing the CM will decide if additional clarifications on the CM are needed, and how to do so. On 16 July 2024, MDDI conducted a briefing to explain how the July 2024 CM applied in different contexts, and to answer questions from the agencies.⁷ Two officers from ACRA’s data governance team attended the briefing. They were not involved in the development of the new Bizfile portal.

43. The next day, MDDI emailed a video recording of the briefing and a Frequently Asked Questions (“FAQ”) document to the data governance teams of all agencies, including ACRA. These were also subsequently uploaded on a Government Intranet microsite for data management matters, which agencies’ data governance teams have access to. This microsite is separate from the Intranet portal for CMs.

44. The FAQ document contained MDDI’s responses to common queries from agencies, and was updated by MDDI several times after the 16 July 2024 briefing to include new questions from the agencies. The document included elaborations on when and how agencies were to cease the use of masked NRIC numbers, which are reproduced below:

Summary	
a.	“For now no need to change how [agencies] have been using NRIC numbers (masked or in full) in communications with the public or in public-facing interfaces (e.g. how NRIC numbers are displayed on the screen after a member of public logs in to his account).”
Question	Answer
b.	“Do I enhance my systems now in order to comply with [paragraph] 9 [of the July 2024 CM] for eventual unmasking of NRIC numbers in public communications?”
	“Agencies should start preparing for the system enhancements (...) but hold off the implementation until [MDDI] announces the unmasking of identifiers with members of public.”

⁷ Over 30 agencies had asked questions during the session, out of more than 80 agencies which attended.

Question		Answer
c.	“What should agencies do with all the masked NRIC numbers currently in existing systems such as our internal systems (...)?”	“With effect from 1 Nov 2024, agencies are not allowed to continue to use masked NRIC numbers in any of [the] internal government systems (...). Agencies should either display the full NRIC number, or consider if there is even a need to use NRIC numbers.”
d.	“Will this move lead to greater risk of security breaches?”	“All data should be managed in compliance with existing requirements in IM8. Agencies should determine if the collection of NRIC numbers for identification is necessary in the first place.”

45. The recording of the briefing and FAQ document, which contained important elaborations to help interpret the July 2024 CM, were emailed to all agency data governance teams, including those who could not attend the briefing. However, they were not appended to the CM.

4.3 Clarifications between ACRA and MDDI on the July 2024 CM

46. After the July 2024 CM was issued, ACRA had internal discussions about the potential sensitivity of showing full NRIC numbers in the *People Search* function, including concerns relating to personal data protection. ACRA was heavily influenced by its earlier exchange with SNDGO in February 2024 where the term “unmask” was used, as well as one sentence in paragraph 7 of the July 2024 CM: “Agencies are also to immediately cease any planned use of masked NRIC numbers, e.g. in new business processes or digital products”. ACRA interpreted this to mean that it was required to display full NRIC numbers in the *People Search* function of the new Bizfile portal, which it regarded to be a new digital product.

47. Officers from ACRA’s data governance team received the video recording of the briefing and FAQ document on the CM, but they did not share these documents with ACRA senior leadership and the project leads for the new Bizfile portal.

48. On 30 July, an ACRA officer in the data governance team, who had not gone through the information from the MDDI briefing and FAQ document on the July 2024 CM, emailed MDDI. The ACRA officer asked MDDI if ACRA needed to cater for system enhancements to remove masking of NRIC numbers in the *People Search* function of the new Bizfile portal that it was developing, in light of the July 2024 CM. In the email exchanges that followed, MDDI told ACRA that it “can continue” to display masked NRIC numbers in the *People Search* function “for now” but should be prepared for “eventual unmasking” of the NRIC numbers, as MDDI was likely to issue “future guidance on the unmasking of NRIC numbers in public communications”.

4.4 Analysis of key misunderstandings between ACRA and MDDI

49. There were two key misunderstandings between MDDI and ACRA on (a) whether the July 2024 CM applied to the *People Search* function of the new Bizfile portal, and (b) how to stop the use of

partial (or masked) NRIC numbers where these had previously been used. These misunderstandings persisted after the briefing and dissemination of the FAQ document, as well as after the email exchanges between the two agencies.

Misunderstanding #1: Whether the July 2024 CM applied to the <i>People Search</i> function of the new Bizfile portal	
July 2024 CM (5 July)	<p>There was a misunderstanding of MDDI’s intent behind the following statement: <u>“Agencies are also to immediately cease any planned use of masked NRIC numbers, e.g. in new business processes or digital products”</u>.</p> <ul style="list-style-type: none"> • MDDI had used the phrase “planned use” to refer to new use cases of masked NRIC numbers. <ul style="list-style-type: none"> ○ The intent was to require agencies not to introduce new use cases of masked NRIC numbers, to avoid adding to the use of masked NRIC numbers beyond existing uses. ○ <i>People Search</i> in the new Bizfile portal was not a “planned use” (or new use case) because it was a service that already existed in the old portal. • ACRA’s interpretation was that the requirement to cease the use of masked NRIC numbers applied to <i>People Search</i> of the new Bizfile portal because the portal was a “new digital product”.
Briefing and FAQ document (16 – 17 July 2024)	<p>The FAQ document stated, “For now no need to change how [agencies] have been using NRIC numbers (masked or in full) in communications with the public or in public-facing interfaces (e.g. how NRIC numbers are displayed on the screen after a member of public logs in to his account)”.</p> <ul style="list-style-type: none"> • This statement provided more clarity on what the July 2024 CM meant, by explaining that agencies were not required to change existing uses of partial NRIC numbers. However, the recording of the briefing and FAQ document were not appended to the CM. This meant that those who did not receive the documents would have read the CM without this additional context. • The recording of the briefing and FAQ document were sent to and received by ACRA officers, including those who could not attend the briefing by MDDI. However, these documents were not disseminated to ACRA senior leadership and the project leads for the new Bizfile portal, who were therefore not aware of and did not consider the documents in their deliberations on the display of NRIC numbers in <i>People Search</i>.
Emails between ACRA and MDDI (30 – 31 July 2024)	<p>MDDI told ACRA that it “can continue” to display masked NRIC numbers in the <i>People Search</i> function “for now” but should be prepared for “eventual unmasking” of the NRIC numbers, as MDDI was likely to issue “future guidance on the unmasking of NRIC numbers in public communications”.</p> <ul style="list-style-type: none"> • MDDI meant that ACRA did not need to stop displaying partial NRIC numbers in <i>People Search</i>, whether on the old or new Bizfile portal, as <i>People Search</i> was an existing external-facing use of partial NRIC numbers. However, this context

	<p>(i.e. that <i>People Search</i> was considered an existing rather than planned use) was not conveyed to ACRA.</p> <ul style="list-style-type: none"> ○ In telling ACRA to be prepared for “eventual unmasking”, MDDI meant to remind ACRA that there were plans to move away from use of masked NRIC numbers in existing external-facing uses in future. ● ACRA’s interpretation was that it could continue to display masked NRIC numbers in the <i>People Search</i> function “for now” on the <u>old</u> Bizfile portal, but was required to unmask NRIC numbers in the <i>People Search</i> function in the <u>new</u> Bizfile portal as soon as possible (“eventual unmasking”). <p>However, in this exchange, both sides did not pick up that ACRA had misunderstood the CM because both sides did not engage each other in depth on what they meant in their emails, which might have clarified the misunderstanding.</p>
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Misunderstanding #2: How to stop the use of partial (or masked) NRIC numbers where these had previously been used	
July 2024 CM (5 July)	<p>The CM mentioned “cease the use of masked NRIC numbers” but did not elaborate on the ways this could be done. In particular, MDDI did not explain that this did not mean showing full NRIC numbers in every case.</p> <ul style="list-style-type: none"> ● MDDI had operated under the assumption that when agencies stopped using partial (or masked) NRIC numbers, they would consider whether NRIC numbers were necessary. This would be in line with the policy guidance contained in existing IM8 requirements. ● ACRA’s interpretation was that the requirement was to “unmask” and display the full NRIC number in the <i>People Search</i> function of the new Bizfile portal. This was influenced by ACRA’s February 2024 discussion with SNDGO, where ACRA had used the term “unmask” to summarise the discussion, but SNDGO did not correct this term.
Briefing and FAQ document (16 – 17 July 2024)	<p>In an FAQ about what agencies should do when stopping internal uses of masked NRIC numbers, MDDI indicated that “agencies should either display the full NRIC number, or consider if there is even a need to use NRIC numbers”.</p> <ul style="list-style-type: none"> ● As mentioned above, ACRA senior leadership and the project leads for Bizfile were not aware of this information.
Emails between ACRA and MDDI (30 – 31 July 2024)	<p>Both teams used the word “unmask” in this exchange, but with different understanding of what this entailed.</p> <ul style="list-style-type: none"> ● MDDI officers used “unmask” as a shorthand for stopping the use of masked NRIC numbers. ● ACRA officers took “unmask” to mean showing the full NRIC numbers.

4.5 Panel's findings on shortcomings

Shortcoming #1: MDDI should have been clearer in its policy communications in its July 2024 CM. MDDI and ACRA staff did not realise that ACRA had misunderstood how the July 2024 CM applied to the new Bizfile portal.

50. **Given that this was a complex policy, MDDI should have been more precise and provided more context in the CM.** This would have helped agencies like ACRA better interpret the CM.

- a. MDDI should have explained key terms (e.g. “planned use”) in the CM more clearly. For example, MDDI intended for “planned use” to refer to new use cases, regardless of whether the use case was for an existing or new digital product. Hence, MDDI should not have cited new digital products as an example of a planned use in the CM.
- b. The CM should also have explained that stopping the use of partial (or masked) NRIC numbers did not mean showing full NRIC numbers in every case.
- c. These clarifications were only made in the FAQ document and subsequently when MDDI was seeking agencies’ returns on existing external-facing uses of partial NRIC numbers. To make sure that the clarifications were clearly understood and easily referenced by agencies, MDDI should have appended the FAQ document to the CM, or reissued a revised CM that captured the key clarifications.

51. The CM should have been clearer. The Panel noted however that MDDI made an effort to ensure the CM was properly understood by agencies.

- a. MDDI held an extensive briefing for agencies to explain how the CM applied in a range of different contexts and to answer agencies’ questions. MDDI also circulated the FAQ document the day after the briefing to address agencies’ queries on the CM.
- b. MDDI also engaged in bilateral clarifications with close to 50 agencies, including ACRA, on various agency-specific use cases. The MDDI officers strove to provide actionable guidance in each case, but it was not possible for the MDDI team to have the same in-depth knowledge of every agency’s individual use case as the agencies would have.

52. Based on what the Panel found, ACRA was the only agency that was rolling out a new portal and had misunderstood the July 2024 CM to the extent that it did.

53. **The Panel noted that ACRA and MDDI had exchanged multiple emails without engaging each other in depth on the crux of the misunderstandings.** For instance, MDDI was not explicit that it considered *People Search* as an existing use (rather than “planned use”) of partial NRIC numbers, which need not be immediately stopped. ACRA also did not indicate to MDDI that it had interpreted the CM as requiring agencies to “unmask” partial NRIC numbers by replacing them with full NRIC numbers in all instances.

54. The Panel was of the view that officers in both agencies should have taken the initiative to discuss the matter in depth, given that there were important details to clarify and that the new Bizfile portal is a major public platform.

55. The Panel would like to underscore the following:

- a. Agencies responsible for policies should clearly explain the broader policy context and considerations when issuing policy directives that affect the wider Public Service. They should ensure that the terms used are clear and unambiguous, and make available all necessary information and/or references to the necessary information in one place.
- b. Implementing agencies should ensure that they understand the directives and how these apply to their specific context. They should escalate matters internally and with the agencies responsible for the policies if they are unclear or have concerns.

56. By and large, the vast majority of policies are communicated and understood well by both policy-owning and implementing agencies. The above are longstanding practices of the Public Service, but were not adequately adhered to in the case of the Bizfile incident. The Panel reminds all agencies to take active steps to cement these practices within their organisations, which are especially critical for complex policies.

Shortcoming #2: There were internal shortcomings within ACRA in sharing and acting on the information from MDDI on the July 2024 CM.

57. **The Panel was of the view that the insufficient sharing of information within ACRA had contributed to the misunderstandings between ACRA and MDDI on the July 2024 CM.** The ACRA officers who attended the 16 July 2024 briefing as well as the ACRA officers who received the FAQ document via email should have ensured that the information was disseminated as widely within ACRA as the original CM, in particular to those who needed to act on the CM. However, this was not done.

58. As the clarifications in the briefing and FAQ document were not shared with the project leads for the new Bizfile portal and ACRA’s senior leadership, they did not have the context of critical explanations on how to apply the July 2024 CM. For example, the FAQ document would have alerted them to the fact that stopping the use of partial NRIC numbers did not mean showing full NRIC numbers in every case, and agencies could drop the use of NRIC numbers altogether.

59. As a result, ACRA continued to misinterpret the July 2024 CM, and had acted on incomplete information when it decided to disclose full NRIC numbers in the *People Search* function of the new Bizfile portal. The Panel recommends that ACRA review its internal processes to ensure that there is sufficient dissemination of information within the organisation, to the relevant officers and teams who require it to make informed decisions.

Shortcoming #3: MDDI should have paid more attention to the implementation plan for new use cases of partial NRIC numbers that were more complex, such as public registries.

60. The Panel was of the view that MDDI should have accorded greater attention to its implementation plan for agencies to stop the introduction of new use cases of partial NRIC numbers that were more complex. MDDI should have provided more policy guidance on safeguards that agencies should put in place, if the agencies assessed that the use of full NRIC numbers was truly necessary for this subset of use cases.

61. MDDI's July 2024 CM had asked agencies not to introduce any new use cases of partial NRIC numbers, without differentiating by complexity of the use case.

- a. MDDI explained to the Panel that the rationale was to avoid proliferating the use of partial NRIC numbers. Otherwise, agencies would have to expend resources to make changes on these use cases later on (i.e. to use other identifiers or full NRIC numbers).
- b. MDDI had operated under the assumption that when agencies stopped using partial NRIC numbers for new use cases, they would consider whether full NRIC numbers were necessary, and put in place appropriate data protection controls and measures if full NRIC numbers were used. This would be in line with the policy guidance contained in existing IM8 requirements. MDDI also took into account the fact that before the July 2024 CM was issued, agencies had already been using full NRIC numbers in external-facing use cases when they needed to accurately identify individuals.

62. MDDI should have provided additional policy guidance to more complex new use cases, to help agencies understand how to stop the use of partial NRIC numbers, and decide whether full NRIC numbers were necessary. Although Bizfile's *People Search* function was technically an existing use case, rather than a new use case like ACRA had thought, it was a more complex use case which warranted more deliberate guidance by MDDI. Bizfile was a public registry which could potentially disclose a large amount of data to third parties performing searches. This was unlike the majority of external-facing use cases of partial NRIC numbers, which involved individuals accessing or viewing their own NRIC numbers, such as in government correspondence with members of the public.

63. The Panel noted that MDDI did consider this issue of complexity, when deciding on the implementation approach for existing external-facing use cases. In the July 2024 CM, MDDI had asked agencies to provide information on their existing external-facing use cases so that it could assess how best to coordinate the transition. MDDI's preliminary plan to move away from the use of partial NRIC numbers in existing external-facing use cases, was to start with one-to-one correspondence between the Government and members of the public. As for other existing external-facing use cases that were more complex, MDDI had planned to accord greater attention and more careful policy guidance. MDDI should have taken a similar approach for more complex new use cases.

Section 5: Design and Implementation of *People Search* Function

64. This section examines how ACRA designed and implemented the *People Search* function, pursuant to the July 2024 CM.

65. It is important to note that the use of full NRIC numbers is not prohibited when individuals need to be identified accurately. In the case of Bizfile, ACRA's role as the national business registry required it to provide public access to information such as NRIC numbers for corporate transparency purposes. The full NRIC number has always been publicly accessible in the *People Profile*, although it has to be purchased for a fee to deter frivolous requests. This approach strikes a balance between corporate transparency and personal data protection.

66. The Panel was of the view that the degree and ease of access to full NRIC numbers in the *People Search* function at the launch of the new Bizfile portal was inappropriate. Individuals' full NRIC numbers were made too easily available to those who were improperly using the *People Search* function in a way that went beyond its intended purpose. Users could potentially access multiple records of NRIC numbers through the *People Search* function if the individuals' names matched the search term used. As the full NRIC number is a form of personal data, ACRA should have taken steps to mitigate against improper use of the *People Search* function.

5.1 Background of the design of the *People Search* function on the new Bizfile portal

67. ACRA began developing the new Bizfile portal in 2022. System development was outsourced to a vendor via open tender, which is a common practice for public sector ICT&SS projects, and was overseen by a Steering Committee chaired by ACRA's CE. The *People Search* function in the new Bizfile portal was originally meant to work similarly to the old Bizfile, i.e. display partial NRIC numbers alongside the corresponding names in the search results.

68. However, as ACRA interpreted the July 2024 CM as requiring the unmasking of NRIC numbers for all new digital products, it instructed its vendor to make changes so that when the new Bizfile portal was launched, the *People Search* function would show full NRIC numbers. ACRA had wanted to implement the changes when the portal was launched to avoid additional downstream costs for making subsequent changes.

5.2 Panel's findings on shortcomings

Shortcoming #4: In deciding to disclose full NRIC numbers in *People Search*, ACRA did not first assess the proper balance between sharing full NRIC numbers and ensuring that they were not too readily accessible. This contravened the Government's internal rules on data management.

69. The Panel found that ACRA did not first assess the proper balance between (a) the public interest in sharing full NRIC numbers, which was to promote corporate transparency; and (b) the

competing public interest in ensuring that full NRIC numbers were not too readily accessible, since they were still personal data which many viewed as sensitive information, before deciding to disclose full NRIC numbers in the search results of *People Search*. This was a contravention of IM8, which ACRA was required to comply with under the PSGA. Instead of assessing this balance, ACRA had layered what it understood to be the requirements of the July 2024 CM onto its existing system design, and did not consider that the primary purpose of *People Search* was to help narrow down which *People Profiles* to purchase.

70. **The Panel was also of the view that ACRA should have thoroughly considered alternative designs of the *People Search* function in the new Bizfile portal.** The *People Search* function could have been designed to allow a user to retrieve only the data required for the user to identify the *People Profile* that the user wished to purchase. For example, users could have been required to filter their search on the *People Search* function by keying in additional search parameters like the Unique Entity Number of the associated business entity.

71. Although ACRA was aware of the risks of displaying full NRIC numbers, it did not adequately consider alternative designs of the *People Search* function, for the following reasons.

- a. First, the July 2024 CM was issued during the final development stages of the new Bizfile portal. This was a complex project that required a major overhaul and implementation of new functions to improve user experience, and *People Search* was just one of the many functions in the new portal. Given the scale and complexity of the project, ACRA had to make numerous decisions at various stages under time pressure, to ensure that the new portal could be launched on time and in adherence with prevailing government policies. As ACRA thought that the disclosure of full NRIC numbers was a central directive from MDDI, it had prioritised compliance over its internal concerns on displaying full NRIC numbers.
- b. Second, ACRA was influenced by its role as the national registry for businesses. ACRA's organisational remit and mindset were to be transparent and facilitative in providing information for businesses to operate smoothly. Moreover, full NRIC numbers were already disclosed in the purchased *People Profile*, and prior to 2016, in the *People Search* function.

72. Nevertheless, ACRA should have, as required by IM8, made the necessary assessments and designed the *People Search* function such that users would not have been able to retrieve more data than needed. ACRA should have struck the appropriate balance between sharing full NRIC numbers and ensuring that full NRIC numbers were not too readily accessible.

73. The Panel noted that the incident took place before public education and engagement had begun on the proper use of NRIC numbers as a unique identifier. Many members of the public would therefore not have been familiar with the issues associated with the use of NRIC numbers for authentication, and the false sense of security from using partial NRIC numbers. This exacerbated public concerns when full NRIC numbers were easily searchable and accessible in the *People Search* function. To better prepare the public for this significant shift in norms, mindsets and practices over

the use of the NRIC number, the Panel was of the view that it would have been better for MDDI to have embarked on public education and engagement earlier than what it had planned.

74. The Panel would like to emphasise the importance of agencies regularly assessing data security and protection risks, taking into account user needs and public concerns. When there is a new policy direction, agencies should re-assess the adequacy and appropriateness of their system design and make comprehensive assessments of different options to meet the policy objective. As the agency in charge of public sector ICT&SS policies, MDDI should follow up by reminding agencies of these responsibilities.

Section 6: Security Features for *People Search* Function

6.1 Implementation of security features

75. Under the terms of its contract with ACRA, the vendor was, among other things, required to implement various security features in the *People Search* function of the new Bizfile portal. These features would protect against unintended uses by, for instance, limiting the extent of searches allowed. The specified security features, which were already in place in the old Bizfile portal, included a CAPTCHA functionality to differentiate humans from bots.

76. To ensure that the security features were properly implemented, the vendor was required to ensure that web application penetration tests were conducted. The vendor engaged an independent security reviewer to conduct the web application penetration tests. These are common arrangements for public sector ICT&SS projects that are outsourced.

77. In November 2024, the vendor submitted a report to ACRA which did not indicate any issues with the *People Search* function based on the penetration tests conducted by the independent security reviewer.

78. ACRA accepted the report and launched the new Bizfile portal on 9 December 2024.

6.2 Panel's findings on shortcomings

Shortcoming #5: Certain security features for the *People Search* function were not adequately implemented.

79. After disabling the *People Search* function, on 14 December 2024, ACRA requested that GovTech review the security features of the *People Search* function. This review found that some security features, including the CAPTCHA functionality, were not adequately implemented, allowing potential data retrieval using scripts from 9 to 13 December 2024.

80. Upon detecting these security issues, ACRA immediately asked its vendor to resolve them urgently. These security issues were fixed by the time the revised *People Search* function resumed on 28 December 2024.

81. The Panel understands that ACRA is following up with the vendor and considering all its available options. Without prejudice to any such options, the Panel notes that ACRA remains ultimately accountable for the implementation of the *People Search* function, even though it had contracted this to its IT vendor. ACRA is also reviewing its implementation of Bizfile.

Section 7: Incident Response and Management

82. This section examines the agencies' response to the incident from the point when concerns by members of the public were first raised on 12 December 2024, till the point when the *People Search* function was disabled on 13 December 2024.

7.1 Facts and sequence of events

83. The new Bizfile portal was launched on 9 December 2024. On 12 December 2024, the Government Data Security Contact Centre ("GDSCC")⁸ started receiving public feedback which expressed concerns that users could access individuals' full NRIC numbers on *People Search*. After a brief exchange of correspondence with ACRA, GDSCC replied to the public feedback on the same day. The reply did not address why *People Search* was showing full NRIC numbers, and stated that one of ACRA's functions was to provide access to information of company office holders, such as their identification details, for corporate transparency.

84. On the same day, a separate group of MDDI, MOF and ACRA officers had begun working on a separate inter-agency response to the public feedback and media queries that they had received on the issue. In the course of establishing the background facts, the agencies discovered that there had been a misunderstanding of the July 2024 CM and its application. The decision to disable the *People Search* function was made on 13 December 2024 and carried out on that night. MDDI and ACRA also issued media statements and responded to the public feedback on 13 – 14 December 2024. The following week, on 19 December 2024, the Ministers from MDDI and MOF, and ACRA's CE held a press conference on the issue.

85. Over 500,000 queries were made on *People Search* over the 5-day period between 9 and 13 December 2024, higher than the usual daily traffic of 2,000 to 3,000 queries. The bulk of these queries were made on 13 December 2024, after news of the disclosure of full NRIC numbers in the *People Search* function broke. These searches came from an estimated 28,000 IP addresses, most of which were from Singapore. ACRA is unable to identify the exact number of NRIC numbers that were disclosed through these queries, as the Bizfile portal is not configured to track individual queries for the *People Search* function.

86. To minimise the service degradation for Bizfile users, ACRA launched a revised *People Search* function on 28 December 2024, where the search results no longer show any NRIC numbers (partial or full).

⁸ GDSCC was set up in April 2020 for members of the public to report data incidents involving government data or government agencies, in order to strengthen the Government's capabilities to detect data incidents.

7.2 Panel's findings on shortcomings

Shortcoming #6: The incident management after public concerns on the new Bizfile portal surfaced on 12 December 2024 should have been better.

87. **The Panel found that ACRA and MDDI should have acted more quickly to ascertain the key facts of how the incident happened, and ACRA should have disabled the *People Search* function sooner, after public concerns surfaced on 12 December 2024.** ACRA and MDDI had taken some time to realise that ACRA had misunderstood the July 2024 CM, before they sought to clarify and assess whether the manner and extent of disclosure of full NRIC numbers in the *People Search* function were appropriate. ACRA took some time to decide to disable the *People Search* function as it had to consider (a) the extent of access to full NRIC numbers in the search function, against (b) ACRA's mandate of providing access to information on individuals associated with business entities for corporate transparency reasons.

88. ACRA also worked with its vendor to assess the feasibility of alternative solutions besides disabling the *People Search* function, given the impact that this would have on businesses and individuals who might need it to conduct their due diligence checks. The Panel noted that the *People Search* function was disabled within hours, once the decision to do so was made.

89. In retrospect, the agencies should have placed greater emphasis on assessing whether the manner and extent to which NRIC numbers were being disclosed in the *People Search* function were appropriate, even while they were seeking to clarify the differing interpretations of the July 2024 CM's instructions. Doing so could have helped the agencies to decide and disable the *People Search* function earlier.

90. **The Panel was also of the view that agencies should have been better coordinated and responded more fully to the public's concerns about the *People Search* function.** Different groups of officers in the agencies were trying to respond to the public queries, but did so without close coordination. For example, a group of GDSCC and ACRA officers was responding to public queries on this issue without knowledge that there was a separate discussion between MDDI, MOF and ACRA to formulate a more comprehensive response. GDSCC's initial reply to the public feedback also did not address the concerns about *People Search*. **The Panel recommends that GDSCC and ACRA review their internal processes for handling replies to public feedback, including to improve inter-agency coordination where public feedback on the same issue is received through multiple channels.**

91. **Public communications in the aftermath of the incident on the correct uses of the NRIC number should also have been clearer.** In hindsight, the Government should have made clear to the public at the outset that moving away from the use of partial NRIC numbers did not automatically mean using full NRIC numbers in every case, nor was it the Government's intention to disclose full NRIC numbers on a large scale. Doing so would have helped to reassure the public that NRIC numbers remain personal data, which should only be collected, used or disclosed when there is a need to do so.

Section 8: Conclusion

92. In summary, the Panel identified several key shortcomings from its review of the Bizfile incident, the confluence of which led to the unintended outcome of full NRIC numbers being easily accessible on *People Search* during 9 to 13 December 2024.

- a. MDDI should have been clearer in its policy communications in its July 2024 CM. MDDI and ACRA staff did not realise that ACRA had misunderstood how the July 2024 CM applied to the new Bizfile portal.
- b. There were internal shortcomings within ACRA in sharing and acting on the information from MDDI on the July 2024 CM.
- c. MDDI should have paid more attention to the implementation plan for new use cases of partial NRIC numbers that were more complex, such as public registries.
- d. In deciding to disclose full NRIC numbers in *People Search*, ACRA did not first assess the proper balance between sharing full NRIC numbers and ensuring that they were not too readily accessible. This contravened the Government's internal rules on data management.
- e. Certain security features for the *People Search* function were not adequately implemented.
- f. The incident management after public concerns on the new Bizfile portal surfaced on 12 December 2024 should have been better.

93. While the Panel did not find any factual evidence of deliberate wrongdoing or wilful inaction by the MDDI and ACRA officers involved in this incident, the shortcomings, including ACRA's contravention of IM8, identified by the Panel should have been avoided. The Public Service Division, MDDI and ACRA will separately follow up to review the actions and responsibilities of the relevant individual officers. This will be conducted in accordance with the applicable accountability and disciplinary frameworks and processes in the respective public agencies involved.

94. In this incident, the Public Service did not perform to the level we set for ourselves. We should have done better, and this review contains important lessons which we will apply. More importantly, the lessons that the Panel had identified will be disseminated across the whole of the Public Service, so that agencies can take these on board and similar incidents do not recur.

95. The Panel expresses its thanks to the leaders and officers of MDDI and ACRA for their close co-operation in this Review, and for their contribution to the conduct of the AAR in an open and constructive spirit.

Annex: Issues Regarding the Use of Full and Partial NRIC Numbers

- The NRIC number is unique to each individual. It allows the individual to be referred to accurately. Unlike full NRIC numbers, partial NRIC numbers are not sufficient to refer to each individual uniquely. Therefore, partial NRIC numbers are unable to fulfil the need for accurately referring to each individual.
- It is important to accurately refer to an individual by using the full NRIC number when required by law, and for other purposes, for example for medical procedures and business transactions. The full NRIC number therefore has to be disclosed in these circumstances and is known to others.
- However, the NRIC number had also become used by some organisations not just to accurately refer to the individual, but also based just on the NRIC number, to provide access to that individual's account information, to allow the person to carry out transactions, or to allow the person to be provided services. The use of the NRIC number in this way is unsafe, as the person's NRIC number is likely to be already known to other persons or organisations.
- The Government had therefore decided to stop the unsafe practice of providing access to important Government services, transactions and sensitive personal information based on just using the NRIC number for access.
- Some organisations and people had also come to assume that the use of partial NRIC numbers means that the full NRIC number is thereby concealed and protected. This is not the case, and provides a false sense of security. Partial NRIC numbers are not effective in concealing the full NRIC numbers. It is not difficult to work out the full NRIC number from the partial NRIC number, particularly if one knows or is able to make a good estimate of the person's year of birth. With the availability of online algorithms, it is now easier and faster to work out full NRIC numbers from the partial NRIC numbers.
- The use of partial NRIC numbers neither meets the need to have an accurate way of referring uniquely to an individual, nor does it offer effective protection from the full NRIC becoming known.
- The Government had therefore decided to move away from using partial NRIC numbers in the public and private sectors, with the public sector taking the lead.