



# Gambling Harm Minimisation

## Facial Recognition and Player Card-based Gaming Technologies

A report to the Tasmanian Liquor and Gaming Commission addressing technology and implementation considerations for facial recognition and player card-based gaming technologies for use with gaming machines in licensed casinos, hotels and clubs in Tasmania.

Prepared by: Gaming Consultants International

April 2022

## Table of Contents

<b>Glossary</b> .....	<b>5</b>
<b>Introduction</b> .....	<b>7</b>
Background.....	7
Acknowledgements.....	7
Disclaimer .....	7
Consultant Relevant Expertise .....	7
<b>Executive Summary</b> .....	<b>8</b>
The spectrum of harm minimisation measures.....	8
FRT as a consumer control harm minimisation measure .....	8
Pre-commitment as a consumer control harm minimisation measure .....	9
A pathway to the implementation of FRT .....	9
A pathway to the implementation of player pre-commitment .....	10
Related initiatives in other States .....	11
<b>List of Considerations</b> .....	<b>12</b>
Facial Recognition Technology.....	12
Player Pre-commitment Systems .....	12
<b>Consultant Opinion Relative to Player Pre-commitment</b> .....	<b>13</b>
Introduction .....	13
Factors considered in developing the opinion .....	13
Example Approach for Phasing of Jurisdictional Settings .....	13
Capabilities of current gaming machine protocols.....	14
Preferred Player Card technology .....	15
Commission approval for EGM hardware modifications.....	15
Changes to Venue EMS Host to support third party pre-commitment system suppliers .....	15
Central reporting when a pre-commitment limit is reached .....	15
<b>1 Facial Recognition Technologies</b> .....	<b>16</b>
<b>1.1 Technology Basics</b> .....	<b>16</b>
Control Images.....	16
Image Capture Device .....	16
Comparison/Matching System.....	16
Facial Characterisation .....	17
FRT is a detection mechanism .....	17
<b>1.2 Accuracy of FRT Systems</b> .....	<b>17</b>
Control Image Quality .....	17
Image Capture Device and Set-up .....	17
Countering disguise attempts .....	18
FRT Algorithm effectiveness.....	18
<b>1.3 Facial Recognition in Gaming Settings</b> .....	<b>18</b>
Conventional Human-based facial recognition .....	18
FRT Systems in Gaming Settings.....	18
Human intervention is still necessary .....	19
<b>1.4 Facial Recognition as a Harm Minimisation measure</b> .....	<b>19</b>
Integration with Exclusion Systems .....	19
South Australia FRT and Barring (exclusion) .....	19
<b>1.5 Implementation Considerations</b> .....	<b>20</b>
Legal use of FRT .....	20
Who is best placed to operate FRT Systems as a harm minimisation measure in Tasmania?.....	20
What images should be used in the control set (for later recognition)? .....	20



Capacity and supportability of the TGES system .....	21
Venue Operator Agreement.....	21
Commission FRT System Technical Standards .....	21
FRT Algorithm Accuracy.....	21
FRT System Approval Process.....	21
Implementation guidelines for Venue Operators .....	22
<b>1.6 Implementation Risks .....</b>	<b>22</b>
Technology has low implementation risk.....	22
Operational implementation risks .....	22
Ineffectiveness of FRT as a harm minimisation measure.....	22
<b>1.7 Indicative Cost and Next Steps .....</b>	<b>22</b>
Venue costs for FRT System installation.....	22
Ongoing venue operating costs .....	23
Enhancement to the TGES on-line database system.....	23
Implementation sequencing.....	23
<b>2 Player card-based Gaming Technologies .....</b>	<b>24</b>
<b>2.1 Definitions .....</b>	<b>24</b>
Player Card .....	24
Player Card Data .....	24
Player Card Reader .....	24
Player Display .....	24
Interface Device .....	24
Player Card Gaming Applications.....	25
Player Gaming Data.....	25
<b>2.2 Player Card Gaming Applications.....</b>	<b>25</b>
Common elements.....	25
Card Readers and Player Displays not connect directly to Gaming Machines .....	25
Gaming machines do not operate player card gaming applications.....	<b>Error! Bookmark not defined.</b>
Player Tracking (Loyalty) systems.....	26
Card-based Cashless Gaming.....	26
Government mandated harm minimisation measures for Player Card systems .....	27
<b>2.3 Player Pre-Commitment Systems .....</b>	<b>27</b>
Key Elements of a pre-commitment system .....	27
Pre-Commitment enrolment/registration.....	28
Limit setting/amendment.....	28
Pre-Commitment gaming activity tracking .....	28
Limit progress reporting .....	29
Action on any limit being reached.....	30
Player Information.....	30
Jurisdictional Requirements.....	30
<b>2.4 Pre-Commitment as a Harm Minimisation Measure .....</b>	<b>31</b>
Technology impact on pre-commitment effectiveness .....	31
Non-technical factors impacting the effectiveness of pre-commitment systems.....	31
<b>2.5 Pre-Commitment System Implementation Considerations .....</b>	<b>32</b>
Voluntary Vs Mandatory Participation.....	32
Statewide or Venue-based participation .....	33
Mandatory setting of limits .....	33
Anonymous participation .....	33
Limit Types and Defaults .....	34
Action on limit reached .....	34
Pre-commitment system provider .....	34



Pre-Commitment player card technology .....	35
Gaming activity sessions .....	35
Integration with other player card applications .....	35
Commission Pre-commitment System Technical Standard .....	35
Pre-commitment system ability to detect excluded persons.....	35
<b>2.6 Pre-Commitment System Implementation Risk .....</b>	<b>36</b>
Potential technical risk .....	36
Potential commercial risk.....	36
Potential political risk .....	36
<b>2.7 Pre-Commitment System Indicative Cost and Next Steps .....</b>	<b>37</b>
<b>Relevant activities in other states.....</b>	<b>38</b>
<b>Appendix 1: Differences in Player Card Technologies .....</b>	<b>39</b>
Introduction .....	39
Magnetic Stripe Card .....	39
Smartcard .....	40
RFID card.....	41
Digital Wallet.....	42
Player card technology comparison and consultant opinion .....	43



## GLOSSARY

<b>Term</b>	<b>Means</b>
Act	<i>Gaming Control Act 1993</i> (Tas), including any amendments as a result of the <i>Gaming Control Amendment (Future Gaming Market) Act 2021</i> and any regulations made under the Act.
AML/CTF	Anti-Money Laundering/Counter Terrorism Financing
API	Application Programming Interface – a standardised means for connecting computers and transmitting data between them
BLE	Low Energy Bluetooth communications
BOEN	South Australia Barring and Online Employee Notification system
CBS	Consumer and Business Services, a division of the South Australian Government's Attorney-General's Department
Central EMS Host	The central point of an EMS which maintains communications with all venues, and collects and stores gaming machine financial and event data
Commission	Tasmanian Liquor and Gaming Commission
Department	Tasmanian Department of Treasury and Finance
EGM	Electronic Gaming Machine
EMS	Electronic Monitoring System operated by the Monitoring Operator
FRT	Facial Recognition Technology
FRT System	The combination of hardware and software elements incorporating FRT to generate alert messages and reporting
GCI	Gaming Consultants International
Interface device	An electronic component, typically installed within the cabinet of a gaming machine, that interchanges information between a gaming machine communication port and a player card gaming application, and to manage data flow with attached peripherals such as a player card reader and a player display.
ISO	International Organisation for Standardisation
Liquor and Gaming Branch	The Department of Treasury and Finance, Liquor and Gaming Branch
LMO	Licensed Monitoring Operator
Monitoring Operator	The holder of a monitoring operator's licence under the Act
NFC	Near Field Communication
Player card	A card issued to a person upon registration with a player card gaming application
Player card data	Data stored on a player card that is read by, or transmitted to a player card gaming application
Player card gaming application	An activity or process related to gaming, whereby it is necessary to identify a specific person using a player card



<b>Term</b>	<b>Means</b>
Player card reader	A device attached to a point of gaming activity, or other service point where a player needs to be identified, which can read player card data from a player card
Player display	A display device at a gaming machine that may be a separate display screen (i.e., not the EGM screen), or is capable of causing external messages to be displayed on the EGM screen (e.g., a picture-in-picture capability). A player display may also incorporate a 'touch screen' overlay that allows the capture of patron inputs.
Player gaming data	Data or information generated by a gaming device when used by a person with a player card
QCOM	A gaming machine communication protocol developed and licensed by the Queensland Office of Liquor and Gaming Regulation
RFID	Radio Frequency ID
TGES	Tasmanian Gambling Exclusion Scheme
TITO	Ticket In-Ticket Out – a technology that allows for credit transfer from/to a gaming machine using a bar-coded ticket
Venue Operator	A person who is the holder of a licensed premises gaming licence, or a casino licence issued under the Act
Wi-Fi	A capability for devices to connect to each other or the internet wirelessly



## INTRODUCTION

This report has been prepared by Gaming Consultants International at the request of the Tasmanian Liquor and Gaming Commission.

The report presents a range of technology and implementation considerations for the use of facial recognition and player card-based gaming technologies with gaming machines in licensed casinos, hotels, and clubs in Tasmania.

The Commission is required to conduct investigations and report to the Minister on the most cost-effective method of implementing these harm minimisation technologies. This report will assist the Commission with stakeholder consultation and its ultimate report to the Minister.

## BACKGROUND

The report has been guided by the Tasmanian Government's consideration that gambling harm minimisation attributable to gaming machine usage could be improved through better identification of excluded players and the ability for players to set expenditure and time limits on their gaming machine activity.

Stenning & Associates conducted research into the use and outcomes from various facial recognition and player card gaming technologies in jurisdictions in Australia and internationally.

## ACKNOWLEDGEMENTS

GCI thanks the staff of the Tasmanian Department of Treasury and Finance's Liquor and Gaming Branch for their input, and acknowledges the extensive research undertaken by Stenning & Associates.

## DISCLAIMER

Every effort has been made to ensure the accuracy of information presented herein, however GCI makes no warranty, expressed or implied, and no liability for completeness or accuracy is offered.

## CONSULTANT RELEVANT EXPERTISE

Gaming Consultants International is an Australian company with more than 34 years of experience in the Australian and international gaming industry.

Our expertise spans gaming systems, technical standards, technology implementation, legislation and regulations, gaming operations and commercial reviews.

We have provided advice to many gaming operators and Government agencies in respect of system technology selection, the introduction of new technologies, operational structure and resourcing, contract negotiations, and legislative change.

We have deep experience in gaming machine protocols and interfacing, and the introduction and operation of card-based cashless gaming and player pre-commitment capabilities.

GCI's principal consultant and owner, Neil Spencer, is widely recognised throughout Australia and internationally as an expert in gaming technology.

Neil has also provided independent technical advice to the Australian Gaming Technologies Association over many years and is an Advisory Member of the International Gaming Standards Association.

This report was prepared by Neil Spencer.

Any enquires can be directed as follows:  
[neil@gamingconsultants.com.au](mailto:neil@gamingconsultants.com.au)  
+61 418 543 169



## EXECUTIVE SUMMARY

### The spectrum of harm minimisation measures

In its 1999 report on Australia's gambling industries<sup>1</sup>, the Productivity Commission categorised harm minimisation measures as being either:

- a) Informed choice: the ability to make an informed decision on whether to engage in gambling activities;
- b) Consumer control: measures designed to direct individuals and their actions; or
- c) Venue/game restrictions: regulatory limitations placed upon operators and venues as well as technical restrictions on machine and game features.

We consider FRT and Player Pre-commitment systems to be consumer control harm minimisation measures; however mandatory (or full) participation in player pre-commitment may also be considered a venue/game harm minimisation measure.

In our opinion, **successful implementation** of a consumer control harm minimisation measure should be judged on its accuracy, reliability, availability, and ease of use. The **effectiveness** of a consumer control measure is dependent on participation and behaviours, and these are not influenced by the consumer control measure itself.

### FRT as a consumer control harm minimisation measure

There is no doubt that modern facial recognition technologies provide recognition of subjects with high degrees of accuracy.

However, the effectiveness of FRT is anchored in the quantity and quality of control images. i.e., FRT requires a database of known images and "recognition" means that a face detected from a live camera stream has matched an image that had previously been recorded in that database of known images.

In a gaming setting, FRT is well suited to detecting persons previously identified through a self-exclusion process, or other forms of exclusion (provided photos of the persons are recorded).

In South Australia, gaming reforms were introduced in 2019 requiring installation of FRT Systems to prevent barred persons from entering certain gaming venues. Venue FRT Systems are integrated with the State barring (self-exclusion) system and by all accounts this process is working well.

We believe the TGES system in Tasmania could be adapted to provide similar functionality to that operating in South Australia. Capital costs are estimated to be no more than \$25,000 per venue and enhancements to TGES are likely to be in the order of \$300,000.

We see no need for integration with the proposed Monitoring Operator, as FRT Systems do not require gaming machine data, and responding to facial matches requires in-venue staff in real time.

---

<sup>1</sup> Productivity Commission 1999, Australia's Gambling Industries

[Pre-commitment as a consumer control harm minimisation measure](#)

Player pre-commitment is a consumer control measure designed to allow individuals to control their activity at gaming machines.

Effectiveness of pre-commitment requires the combination of technology that allows players to set limits and monitor their activity and relies on actual take-up and usage of the capability.

From a technical perspective, all player pre-commitment systems share common features such as player identification (e.g., card), limit setting, a display interface at a gaming machine, and monitoring of limit progress. However, jurisdictional requirements such as decisions around voluntary/mandatory participation, venue based/Statewide limits, anonymous/registered players, and actions to be taken if a limit is reached impact any ultimate technical solution and implementation cost and timing.

Mandatory capability with voluntary participation in pre-commitment (e.g., the Victorian model, and sometimes referred to as partial pre-commitment) has demonstrated that providing the technical capacity alone does not result in high levels of take-up or participation in player pre-commitment.

Participation in player pre-commitment is impacted by consumer awareness, and motivation, the harm minimisation principles of informed choice, consumer control and venue/game restrictions – all of which are matters for Government policy consideration and direction.

It must be understood that a player pre-commitment system cannot guarantee that a person using a player card is the same registered person associated with that card. (e.g., someone who may have reached a limit uses a card from someone who has not yet reached a limit). Security measures such as a PIN can offer some

level of surety around card usage, but this is not foolproof.

The 2010 Productivity Commission report<sup>2</sup> presented an optimistic outlook for emerging technologies in new gaming machine protocols and network systems that would provide improved ways of delivering effective harm minimisation.

This has not occurred; in fact, no new protocols impacting gaming machine operation have been approved in Australia since the mid-2000s, and no enhancements have been approved for gaming network systems to deliver new functionality or software to a gaming machine.

It must also be understood, that apart from providing the base data upon which expenditure can be monitored, a gaming machine is oblivious to its participation in a pre-commitment system.

In Tasmania, the operation of a player pre-commitment system will require access to real-time gaming machine data and thus will necessitate participation and cooperation of the Monitoring Operator.

[A pathway to the implementation of FRT](#)

Whilst the technology components of an FRT system are generally available 'off the shelf', there are many steps to consider, and implement prior to the commencement of widespread operation in Tasmania; including:

- a) Regulatory impact;
- b) Commission rules, standards, and guidelines;
- c) Legal considerations in relation to existing exclusions and use of data;
- d) Modification to the TGES; and
- e) The potential need for field trials.

Further work is needed to determine any requirement for amendment to the Act or regulations. Matters to be considered include enforcement powers to mandate the operation of FRT Systems, penalties,

<sup>2</sup> Productivity Commission 2010, *Gambling*, Report no. 50, Canberra

and powers of the Commission to approve standards (if deemed necessary).

The Commission would need to consider the necessity for:

- technical standards for FRT Systems including image resolution, minimum data storage, security and access control, privacy, and data exchange between TGES and venue FRT Systems; and
- operational guidelines for venue operators including data security, privacy, installation rules, response/reporting requirements.

We believe it is necessary to confirm that images and data of excluded persons held in the TGES on-line database can be used as control images for a facial recognition in gaming venues in Tasmania without further consent of those excluded persons.

There is also the prospect that existing forms, material and like used in exclusion processes may need to be updated to include acknowledgement that image data will be used in FRT Systems.

The TGES on-line database will require enhancements to facilitate data interchange with FRT Systems in gaming venues prior to any field trials or wide-spread introduction of FRT. This means completion of detailed business requirements and functional specifications, design, implementation, and testing, including an API for data interchange.

We see no need to specifically trial facial recognition as a technology, however the specific implementation for Tasmania should be trialed, and evaluated with one or more candidate FRT Systems prior to statewide rollout.

We believe the technology development aspects of FRT implementation, including TGES enhancements could be completed within a 15-to-20-month timeframe – but we have no capacity to comment on timing for regulator readiness or activities required of the Commission.

#### [A pathway to the implementation of player pre-commitment](#)

As with FRT, there are many steps to be addressed prior to the commencement of player pre-commitment in Tasmania; including:

- a) Regulatory impact including determining jurisdictional settings;
- b) Impact on gaming machines and EMS;
- c) Commission rules, standards, and guidelines;
- d) System design; and
- e) The potential phasing of jurisdictional requirements that may enable the collection of baseline data and research to further inform limit setting requirements.

Further work is needed to determine the likely requirement for amendment to the Act or regulations. Matters to be considered include:

- a) Pre-commitment operational system settings such as mandatory or voluntary player participation, statewide or venue based, mandatory player registration or anonymous participation;
- b) To what extent the Monitoring Operator is required to participate;
- c) Fees levied to venue operators and by whom;
- d) Enforcement powers to mandate the operation of pre-commitment systems
- e) Penalties; and
- f) Powers of the Commission to approve standards (if deemed necessary).

We recommend further consideration of the impact on gaming machines and the Monitoring Operator's EMS to support the ultimate pre-commitment operational settings including:

- a) Capabilities of the current gaming machine communication protocols (particularly around player messaging, EGM status messaging, and response to external commands to enable/disable an EGM);
- b) Recommended form of player card;
- c) Commission approval for hardware modifications to EGMs to house a player card reader, player display and interface device;



- d) Necessary enhancements to a venue EMS host (particularly if third-party service providers are permitted to operate a venue-based pre-commitment system; and
- e) The necessity to centrally report player cards which have reached a limit.

The Commission would need to consider the necessity for:

- technical standards for pre-commitment systems including player card technology, player display and messaging at a gaming machine, data storage and retention, privacy, security controls and system operational parameters; and
- operational guidelines for venue operators including privacy, participant assistance (e.g., for setting limits), player card availability, and reporting requirements.

The system development phase of pre-commitment system implementation requires direction in the form of detailed business requirements to set out mandatory functionality and to provide a framework for ultimate approvals testing.

In our opinion the technical aspects of a pre-commitment system could be developed within a 24- to 30-month timeframe.

The development effort would include detailed business requirements, user experience (e.g., interfaces, messages, and website), modification of the Central EMS Host and Venue EMS Host software, and certification testing.

We believe a pre-commitment capability could be available on all gaming machines in hotels and licensed clubs in Tasmania for an outlay in the order of \$10m.

We have not canvassed detailed estimates from system vendors, however based on corresponding costs for player card readers and interface devices in Victoria (approx. \$3,200/EGM) and an estimated EMS development budget of \$2m we believe this to be an achievable overall budget.

Prior to widespread installation and operation, we believe it is prudent to conduct a limited trial in one or more venues to test system operability, interaction with the EMS, and overall system usability by members of the public.

#### [Related initiatives in other States](#)

Governments in New South Wales, Victoria, and Western Australia are all examining the introduction of player card gaming.

In New South Wales field trials of digital wallets with pre-commitment capability are expected to commence this year and findings from this work may help to inform pre-commitment limits in a Tasmanian setting.

## LIST OF CONSIDERATIONS

### Facial Recognition Technology

1. Consider the requirement, if any, for amendment to legislation or regulations to require the installation of FRT System by Venue Operators.
2. Review the current exclusion framework in Tasmania and make amendments where required to ensure that images and data collection from excluded persons can be stored in an FRT System at a Venue.
3. Depending on the findings of item 2, determine the need to retrospectively seek authorisation from currently excluded persons to store image and other data in an FRT System at a Venue.
4. Develop guidelines for Venue Operators setting out requirements for the installation and operation of FRT Systems, including data security, privacy, location of stored data, venue signage, and reporting requirements.
5. Develop a standard agreement with Venue Operators setting out their obligations and responsibilities in respect of FRT System operation.
6. Approve the form of contract between the venue and FRT System providers.
7. Develop a technical standard for FRT Systems and amend the Commission rules (if required).
8. Determine the most appropriate bodies to test FRT Systems and make recommendations.
9. Modify the TGES on-line database system to provide a statewide set of control images and data, and to make these available to approved FRT Systems via a data interchange process.
10. Define an operational field trial process (including success criteria) prior to the widespread implementation of FRT Systems.

### Player Pre-commitment Systems

11. Determine the most appropriate pre-commitment system operational requirements for Tasmania, including decisions on mandatory or voluntary participation, statewide or venue-based systems, any requirement for mandatory player registration, and whether supply and operation of a pre-commitment system should be the responsibility of the Monitoring Operator or a third-party.

***Outcomes from this item will guide the following considerations.***

12. Consider the requirement for amendment to legislation or regulations necessary to enforce a player pre-commitment.
13. Determine how costs for the operation of pre-commitment would be recouped and from whom, including potential regulatory impact.
14. Review the impact on EGMs and the Monitoring Operator's EMS of the pre-commitment system operational requirements, including potential idle-state messaging on an EGM, and real-time enabling/disabling of an EGM.
15. Develop a technical standard for pre-commitment systems and amend other technical instruments (if required).
16. Develop guidelines for Venue Operators setting out requirements for privacy, participation assistance and reporting requirements.
17. Determine a preferred form of player card, including consideration of card cost, functionality, expected operational life, and implementation cost.
18. Define an operational field trial process prior to the widespread implementation of a pre-commitment system.

## CONSULTANT OPINION RELATIVE TO PLAYER PRE-COMMITMENT

### Introduction

In this section we offer an opinion on the approach to pre-commitment jurisdictional settings and phasing.

This opinion draws upon our experiences in gaming related technology projects, direct participation in the implementation and further review of the pre-commitment system in Victoria, and expert knowledge of relevant technical factors.

This opinion is not the product of consumer or policy research, and we urge the Commission to take advice from others on these topics.

### Factors considered in developing the opinion

**Pre-commitment system and equipment cost:** System, venue/EGM equipment and installation costs are the same for voluntary or mandatory player card use.

Apart from at the casinos, EGMs in Tasmania do not have player card readers and player displays attached. Facilitating player card use will require expenditure at a venue level and the Monitoring Operator will require a control/reporting system (which should be incorporated into its EMS).

**Voluntary participation will not be effective:** Installing a pre-commitment system and equipment alone will not result in consumer participation. Without mandating usage, the Government is at risk of significant backlash from industry (for costs incurred) and responsible gaming bodies/researchers (for a system that delivers poor outcomes).

**Mandatory player card:** Mandating the requirement for a player card (and subsequent collection of individualised consumer gaming machine play data) will deliver rich data which can be used to establish a definitive Tasmania gaming baseline which can also inform further harm minimisation measures.

Mandatory player card use also establishes positive identification of gaming machine players (an AML/CTF Know Your Customer requirement) and is another mechanism to enforce exclusion orders.

**Statewide implementation:** A statewide system from the outset delivers multiple benefits such as providing uniform and consistent implementation in all venues, a common data set for baseline/research, simpler integration with exclusion systems, and creates a known, and hopefully one-off development cost for industry and the Monitoring Operator.

Further, implementation costs at a venue level will be the same for a statewide or venue-based pre-commitment system.

**Jurisdictional requirements should be parameters, not hard coded:** As referenced many times in this report, jurisdictional requirements such as voluntary/mandatory pre-commitment, statewide/venue-based, anonymous/registered need to be set.

However, from a software development standpoint these should be parameters than can be changed from time to time without the need for further system development.

### Example Approach for Phasing of Jurisdictional Settings

A phased introduction of pre-commitment could be as follows:

**Phase 1:** Technology roll-out and mandatory player card



As well as mandatory player card and a statewide system implemented by the Monitoring Operator, we believe that setting a system limit on maximum number of hours played per week on a gaming machine is a practical setting.

The key objectives of this phase are to:

- Install pre-commitment technology across the state;
- Set a statewide requirement for mandatory card use without mandating full and binding limit settings;
- Provide a stream of data for analysis and research purposes (that will inform settings and timeliness of further phases – such as default loss limits); and
- Provide an opportunity to research consumer participation.

**Phase 2:** Introduction of mandatory breaks in play



This phase draws upon the findings of analysis and research on gaming machine play profiles and introduces settings from mandatory breaks in play.

**Phase 3:** Full player pre-commitment



In this final phase, sufficient data has been collected and analysed, and research completed to define requirements for full, binding player pre-commitment, including default loss limits.

Capabilities of current gaming machine protocols

The majority of gaming machines in Tasmania incorporate the QCOM v1.6 communications protocol. It is understood that approximately 150 gaming machines incorporate an older version - QCOM v1.5 and these numbers are likely to diminish through regular EGM refresh.

Both v1.5 and v1.6 versions of QCOM support a host (e.g., an EMS) enable/disable command, hence the ability to disable an EGM from play without the presence of a player card will be possible with all EGMs in Tasmania.

QCOM also provides a Specific Promotional/Advisory Message (SPAM) command where a host (e.g., an EMS) can cause messages to be displayed on a gaming machine screen.

Thus, we expect that all gaming machines in Tasmania can support the requirements for mandatory card play in terms of only permitting game play with the presence of valid player card and providing at least a basic degree of player messaging.



#### Preferred Player Card technology

In our opinion, a player card technology based on magnetic stripe cards would be most effective if mandated.

Whilst not possessing modern, mobile device capabilities of the emerging digital wallet technologies, magnetic stripe technologies offer significant benefits that will continue to be available and relevant for many years; such as:

- a) Intuitive and easy to use;
- b) Low cost (cards and card readers);
- c) Interoperability with other gaming card applications (such as loyalty and card-based cashless gaming); and
- d) Commonly available Interface Devices.

Digital Wallet technologies already offer broad utility in player information, privacy, and even the ability to set pre-commitment limits. However; there are technical and implementation obstacles to be overcome such as differences between communications capabilities of major mobile phone manufacturers and clumsy processing for establishing and maintaining a game play session at an EGM.

#### Commission approval for EGM hardware modifications

All gaming machine manufacturers and operators are aware of the requirement to receive Commission approval to modify an EGM (e.g., installing a player card reader) and thus this will not present a burden on industry.

#### Changes to Venue EMS Host to support third party pre-commitment system suppliers

In our opinion, pre-commitment should be implemented by the Monitoring Operator and thus there is no need to consider third-party system integration to the Venue EMS Host.

#### Central reporting when a pre-commitment limit is reached

In our opinion, requiring the EMS to generate a report of any pre-commitment limit being reached should be mandatory.

This would not be burdensome on a pre-commitment system and such reporting could be used to activate intervention with a card hard holder.

## 1 FACIAL RECOGNITION TECHNOLOGIES

### 1.1 Technology Basics

The origins of FRT can be traced to the 1960s however it is only with the advent of modern, readily accessible computing capabilities, advancements in camera technologies, and complex pattern matching software that FRT has achieved the level of accuracy and reliability to support commercialisation and usage.

As described by Stenning & Associates<sup>3</sup>, FRT is used by government and businesses in a range of industries and applications.

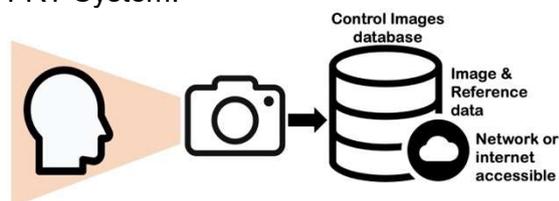
In all settings FRT involves three core elements; namely:

- a set of control images;
- an image capture device; and
- a comparison/matching system.

An FRT System stores or creates a digital profile for each control image using a biometric assessment algorithm. Images from an image capture system (such as a video camera constantly streaming images through an entry way) are processed using the same assessment algorithm and the FRT System generates 'alerts' if a pattern is matched.

#### Control Images

Control images are digital photographs of individuals intended to be **recognised** by an FRT System and are usually stored in a database or easily accessible file system – but not necessarily stored in the FRT System.



Other reference data storage with a control image can include the individual's name, date of birth, telephone, and email contact details.

#### Image Capture Device

An image capture device provides a digital image of a subject or flow of persons.

By far, the most common image capture device in a FRT System is a video camera that provides a continuous stream of images to the FRT System.



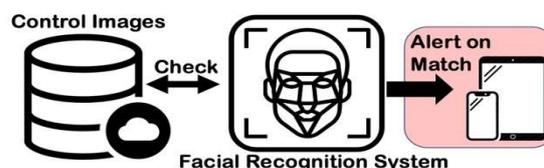
A digital camera can be used as an image capture device for an FRT System, but this would necessitate the strict control of subjects at the time an image is taken. This may work for tight access control, such as entering a secure area, but is impractical for public places with constant traffic flow.

#### Comparison/Matching System

Image comparison/matching is the heart of an FRT System and involves complex software algorithms using artificial intelligence principles.

In simple terms, an FRT System is continuously:

- determining what appears to be a face(s) from a streamed video image;
- creating a biometric representation of a detected facial image;
- comparing the biometric representation against all of the control images;
- alerting on a control image match;
- creating records of image matches (e.g., date, time, image ID); and
- in some instances, requiring a User to input a code or response



<sup>3</sup> Stenning & Associates Gambling Harm Minimisation Technologies Research Report, March 2022



### Facial Characterisation

As well as facial recognition through pattern matching, some FRT Systems are capable of performing subject characterisation such as identifying subject gender and probable age bands.

Age band characterisation is a useful indicator for gaming venue operators in automating detection of under-age persons attempting to enter gaming or licensed venues.

### FRT is a detection mechanism

It is important to understand and appreciate that FRT is a detection mechanism that can be used as a preventative measure (such as barring entrance to a person) but FRT Systems can only raise an alert, not intervention.

Effective use of FRT requires human intervention to act when a control subject is recognised.

## **1.2 Accuracy of FRT Systems**

In ideal conditions, FRT Systems have proven to be more than 99.95% accurate, however such conditions include static sources (i.e., a stationary person), good lighting levels and a high-quality control image to be compared with.

In more realistic settings such as persons moving through a doorway or corridor, FRT System accuracy can be impacted by factors such as:

- Quality of the control images;
- Illumination levels;
- Speed of travel of subjects;
- Pixel resolution of image capture devices;
- Framerate of the image capture device;
- Camera angle of image capture devices;
- The sophistication of the FRT algorithm; and
- Attempts by a subject to disguise themselves

### Control Image Quality

FRT uses anthropometric measurements between facial landmarks when comparing a captured image against a set of control images.

The ISO Standard for Biometric data interchange<sup>4</sup> includes 41 anthropometric landmarks that can be used to define a facial image.

Images stored for FRT purposes should have at least 100 pixels between the eyes of a subject.

Poor quality or low-resolution control images compromises the ability of a FRT System to accurately recognise subjects in a live setting.



### Image Capture Device and Set-up

Clearly the quality and set-up of an image capture device will have an impact on the accuracy of recognising subjects.

As mentioned previously, pixel resolution and image capture frame rate are at the core of an FRT System accuracy, but many other environment factors will contribute to overall system accuracy; including:

- The camera positioning angle (e.g., positioned to be as front-on as possible);
- Avoiding camera placement in high ceiling areas;
- Lighting levels around the subjects;
- Capture through doorways not wide corridors; and
- Potential use of multiple image capture devices.

<sup>4</sup> ISO 19794-5:2011, Information Technology - Biometric data interchange format, Part 5: Face image data

### Countering disguise attempts

Modern FRT algorithms use multiple measurement points across a facial image and continue to offer high levels of accuracy with partially obscured faces. (e.g., the FaceID algorithm on Apple iPhones is able to reliably detect a person with or without glasses).

Clearly there is a level of obscurity which renders an FRT System incapable of identifying a match against control images.



It must be understood that FRT Systems are not a replacement for visual surveillance by venue staff, and it would be expected that staff are trained to recognise attempts to disguise a face and intervene with that person.

### FRT Algorithm effectiveness

Not all FRT Systems use the same recognition algorithms and thus system accuracy, reliability and quality are likely to vary between suppliers.

In a commercial application, a facial recognition algorithm is expected to have been tested, if not certified, by a recognised testing agency with expertise in the field.

In the USA, the National Institute of Standards and Technology<sup>5</sup> is well recognised in the field of FRT Systems testing and publishes research material and FRT System test results.

<sup>5</sup> National Institute of Standards and Technology, a division of the US Department of Commerce ([www.nist.gov](http://www.nist.gov))

In Australia, a number of State Governments trialed the use of FRT Systems as part of home quarantine initiatives in response to the COVID-19 pandemic; however, results on system effectiveness have not been released publicly.

## 1.3 Facial Recognition in Gaming Settings

### Conventional Human-based facial recognition

Human-based detection of patrons at casinos has been a long-established requirement in Australia and internationally.

All Australian casinos use video surveillance, including patron movement detection at doorways/entrances and manual processes to monitor for barred or excluded persons.

Government and industry codes of practice in respect of responsible gambling also include requirements for staff to be trained in harm minimisation techniques and, in many instances, to be informed of excluded or barred persons.

### FRT Systems in Gaming Settings

There are numerous applications for FRT in gaming; including:

- Detection of excluded persons;
- Detection of known criminals;
- Identity checking at staff entrances or entrances to secure areas; and
- VIP customer arrival or movement.

As reported by Stenning & Associates, FRT is used in South Australia, New Zealand, and the United Kingdom as a tool for identifying excluded or barred patrons entering gambling venues.

In 2019 the South Australia Government introduced legislation and regulations<sup>6</sup> requiring facial recognition systems in certain venues offering gaming machines. In New Zealand and the United Kingdom, FRT Systems are used by casino or

<sup>6</sup> *Gambling Administration Act 2019* (SA)



gaming operators as voluntary initiatives, that is, currently without legislative or regulatory mandates. We note also that in New Zealand, legislation authorises the Secretary for Internal Affairs (the gaming regulatory) to introduce minimum standards, and this could potentially include requirements for FRT Systems.

Stenning & Associates also reported that some international jurisdictions, such as Japan and Macau, appear to be in the early phase of identifying FRT and how these technologies may be required in gaming settings.

#### Human intervention is still necessary

As mentioned previously, FRT is an effective mechanism for recognising or detecting a known subject, but in a gaming setting human intervention is required to confirm an individual and to execute appropriate actions.

In South Australia for example, if an FRT System detects a match with a control image, the venue staff are alerted and then required to 'close off' the alert by inputting what actions were taken with the individual.

### **1.4 Facial Recognition as a Harm Minimisation measure**

In the spectrum of harm minimisation measures, FRT offers a mechanism to limit access to land-based gaming opportunities (gaming venues) for historically noted persons such as self-excluded individuals. As described by the Australian Productivity Commission<sup>7</sup> this is a consumer control measure.

Effectiveness of FRT requires a coordinated effort by venue personnel to act upon FRT System alerts and intervene with matched individuals.

The value of FRT as a harm minimisation measure is argued in the research community, and many commentators applaud its value for persons already

identified as exhibiting harm, but not as a preventative tool for others.

FRT does not offer any predictive capabilities such as monitoring betting levels or game usage as image capture devices - they process images from one input source (at a fixed point), compare this with control images and raise alerts if a match is detected.

#### Integration with Exclusion Systems

Integration of FRT with exclusion systems offers much higher likelihood of the detection and intervention with persons if they attempt to enter facilities in breach of exclusion orders.

Modern exclusion systems, regardless of whether they are property based or statewide, include processes and technology to capture and store images and other relevant details of excluded persons – this is the core data needed for FRT control images.

In Tasmania for example, the Tasmanian Gambling Exclusion Scheme<sup>8</sup>, incorporates an online database where images and details of self-excluded persons are stored and accessible by registered users.

#### South Australia FRT and Barring (exclusion)

In South Australia, photographic images and relevant exclusion data (including name, excluded venue(s), and from/to dates) is uploaded and stored in statewide self-exclusion database that is core to their FRT System – the Barring and Online Employee Notification (BOEN) System.

Any gaming venue with at least 30 EGMs and at least 1 EGM with a bank note acceptor must use an approved FRT System connected to BOEN to detect and alert venue personnel if a person entering the gaming area matches an image in the BOEN set of control images.

<sup>7</sup> Productivity Commission 1999, Australia's Gambling Industries

<sup>8</sup> <https://www.treasury.tas.gov.au/liquor-and-gambling/gambling/reduce-harm-from-gambling/tasmanian-gambling-exclusion-scheme>

The FRT system in each venue periodically (at least daily) downloads and securely stores control images relevant to that venue.

Venue personnel are required to respond to FRT System person match alerts including entering details of intervention steps undertaken.

Each FRT System must upload daily operational statistics (e.g., detection counts) to the BOEN system.

## 1.5 Implementation Considerations

### Legal use of FRT

In this report we make no representations in respect of the legal use of FRT.

There is considerable public discussion of this technology, much of which is focused on central Government biometric databases and the use by law enforcement agencies.

Of note however, some public companies have received considerable judgements against them for unauthorised facial recognition – most notably Facebook (now Meta Platforms) was fined \$US5 billion by the US Federal Trade Commission to settle widespread privacy complaints and a further \$US650 million in a class action settlement in Illinois for not seeking consent to use facial geometry.

We recommend further analysis by the Commission that the act of self-exclusion including the collection and storage of a digital photo of a person, provides a legal and contractual basis for that image to be used by FRT Systems.

### Who is best placed to operate FRT Systems as a harm minimisation measure in Tasmania?

In our opinion, the most practical and cost-effective implementation of FRT Systems as a harm minimisation measure in Tasmania would be the combination of an

upgraded TGES (with operational responsibility remaining with the Liquor and Gaming Branch) and in-venue FRT systems purchased and operated by Venue Operators.

This is consistent with the existing obligations of Venue Operators under the Responsible Gambling Code of Practice<sup>9</sup> including the requirement for staff to be trained in recognising people with gambling problems or at risk of developing problems.

This model reflects the existing implementation of facial recognition of self-excluded persons in gaming venues in South Australia.

An alternate approach could be to include responsibilities to operate FRT Systems as either a Core Monitoring Function or Regulated Monitoring Functions of the Monitoring Operator; however, the practicalities around in-venue alerting, intervention, and reporting – all of which require real-time response by humans inside a venue – render this option unnecessarily clumsy, inefficient, and likely to fail in its harm minimisation objectives.

### What images should be used in the control set (for later recognition)?

The Commission may wish to consider the range of persons who should be the subject of potential recognition using FRT Systems.

Self-excluded persons are an obvious inclusion, but the TGES also caters for venue operator exclusion and third-party exclusions (Exclusion Orders under the Act).

The Act also caters for exclusion orders to be issued at the request of the Police Commissioner.

In the majority of instances, digital images and full contact details of persons issued with a venue exclusion order are uploaded

---

<sup>9</sup> Responsible Gambling Mandatory Code of Practice for Tasmania, v3.1, March 2020, issued by the Tasmania Liquor and Gaming Commission

into the TGES on-line database, it is recognised that digital images may not be available in all circumstance; thus, it must be understood that this could impact overall FRT System accuracy to detect all categories of excluded persons.

#### Capacity and supportability of the TGES system

Further work would need to be undertaken to assess the capacity and future supportability of the TGES on-line database system to fulfill the role of master control image repository for an FRT System operating in each hotel and licensed club operating gaming machines.

However, on face, the existing TGES on-line database currently includes functionality to receive digital images and related information from excluded persons including name, address, excluded venue(s) and date ranges.

A more detailed review of the TGES system would need to include:

- Database schema and the ability to store fields in an exportable manner;
- The ability to incorporate an API to allow interfacing with one or more FRT Systems; and
- Control image resolution and format.

#### Venue Operator Agreement

FRT Systems purchased and operated by Venue Operators will store image data and other identifying information of persons in the TGES on-line database and thus, binding agreements between the State and Venue Operators, and potentially FRT System providers (e.g., where the FRT System provider provides a data storage and processing capability in a cloud computing environment) should be established and enforced including:

- The legal basis for storing and use of control image data;
- Permitted use of control image data;
- Requirement for retention and later purging of control data and image data captured at a venue;

- Location of the FRT System data storage (this is particularly important if cloud-based storage is proposed);
- Access control to, and security of, control image data;
- Ownership rights to control image data; and
- Venue Operator obligations in responding to recognition matches

#### Commission FRT System Technical Standards

The Commission should set standards for FRT Systems and require all Venue Operators to ensure that they only use FRT Systems that have been approved under that standard.

The standard should include sections such as:

- Image capture device minimum resolution;
- Communications security;
- System security and access control;
- FRT algorithm accuracy;
- Data storage requirements;
- Encryption and other security measures;
- Requirements for interfacing with the TGES on-line database (i.e., via a standard API); and
- Recognition match alerts.

#### FRT Algorithm Accuracy

Expert advice should be sought to determine minimum accuracy requirements of recognition algorithms.

#### FRT System Approval Process

Commission approval of any FRT System should include a certification by a qualified test agency that the system meets the Commission's FRT System Technical Standard. In Tasmania, a system of approving testers for gaming equipment exists<sup>10</sup>, however it is recommended that further advice be sought on the skills and capabilities of FRT Systems, particularly algorithms for facial recognition.

<sup>10</sup> The Roll of Recognised Manufacturers, Suppliers and Testers of Gaming Equipment, per s70 of the *Gaming Control Act 1993*

### [Implementation guidelines for Venue Operators](#)

The Commission should consider publishing FRT System implementation guidelines to be adopted by Venue Operators.

Guidelines should include criteria such as:

- Positioning of image capture devices to minimise detection of persons not in an excluded area (e.g., a self-excluded person passing by the entrance to a gaming room, but not actually entering);
- Adequate lighting to enhance FRT accuracy;
- Placement of staff orientated 'facial match' screens and alerts outside of public view; and
- Placement of signage to the public advising that facial recording and facial recognition is in use.

## 1.6 Implementation Risks

### [Technology has low implementation risk](#)

In our opinion implementation risks related to the used of FRT Systems as a harm minimisation measure are more likely to be operational than technical.

The technology around storing digital photographs and other identifying data for a person is well established and proven – for example the TGES operating in Tasmania.

Facial Recognition as a technology is well developed and proven in many settings.

FRT Systems are commonly available and in widespread use.

CBS in South Australia has demonstrated that modifying a self-exclusion database to incorporate an API for data transfer with FRT Systems is possible.

FRT Systems do not require interfacing with gaming machines or gaming equipment, thus impact on approvals, internal controls and standards are avoided.

The only potential technology implementation risk we foresee would be modification of the existing TGES on-line

database system to cater for data exchange via an API.

### [Operational implementation risks](#)

We can envisage operational implementation risk emanating from Venue Operators along the lines of:

- Capital cost of FRT Systems;
- (Potential) increase in Internet data costs; and
- Cost of staff training and ongoing intervention when a facial match is triggered.

### [Ineffectiveness of FRT as a harm minimisation measure](#)

Notwithstanding the ability to detect and intervene with excluded persons, FRT has a narrow window of application on the spectrum of harm minimisation and apart from being a recognised enhancement to exclusion breach detection, it offers no other harm minimisation predictive characteristics.

## 1.7 Indicative Cost and Next Steps

Detailed costing of FRT Systems or modification to the TGES on-line database were not sought, however we are confident that the following estimates will give good guidance on the likely costs for implementation of an FRT System at a venue.

### [Venue costs for FRT System installation](#)

Venue set-up and installation costs would include:

- Purchase of image capture devices (it is recommended that at least 2 cameras are acquired and installed)
- Purchase of an FRT system
- Potential purchase of 'match alert' devices (e.g., iPad)
- Installation and commissioning of image capture devices
- Data cabling as required
- Additional power outlets as required

We believe this could be achieved for no more than \$25,000 (note: additional installation costs may apply for remote venues).



Ongoing venue operating costs

Venues may incur increased operating costs covering:

- Licence/maintenance fees for an FRT System
- Increased labour costs to cater for facial match intervention and reporting
- Increased internet data transmission costs

We are unable to speculate an order of magnitude for these additional operating costs.

Enhancement to the TGES on-line database system

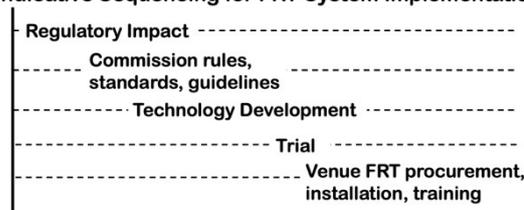
On the assumption that the existing TGES on-line database system would require only development and integration of an API to exchange information with venue based FRT Systems, we believe a budget order or magnitude of \$300,000 would be appropriate.

It is also assumed that the existing system is capable of simultaneous connection to a large number of venues and has the ability to respond to multiple system requests for data (i.e., images and data for excluded persons for a particular venue). If this is not the case – it is expected that major upgrades to the system would be required; exceeding the \$300,000 order of magnitude estimate.

Implementation sequencing

Implementation of FRT Systems requires a structured approach that considers the regulatory and legal framework, rules, and conditions to be issued by the Commission, technology development, and a field operational trial – prior to widespread FRT System acquisition and implementation, as depicted in the diagram below.

Indicative Sequencing for FRT System Implementation



We are not able to offer any insight or comment as to time and effort required to complete the regulatory impact and Commission activities; however, in relation to technology development, we anticipate the following high-level tasks could be completed within a 15- to 20-month timeframe:

- a) Overall technical system design;
- b) TGES system detailed design;
- c) Individual FRT vendor system design;
- d) TGES system enhancement, including data interchange API;
- e) TGES system test;
- f) Interoperability testing with FRT System vendor(s); and
- g) Overall system pre-trial sign-off.



## 2 PLAYER CARD-BASED GAMING TECHNOLOGIES

### 2.1 Definitions

Across industry, Government and literature, different terms are used to describe technologies or systems, and in some cases, multiple terms have the same meaning. Conversely a single term may have multiple meanings; for example: smartcard, player card, restricted use card, account card and loyalty card.

When the term Smartcard was first introduced in 1977 it meant a computer processor and memory integrated into a credit card sized plastic card (also called chip-in-card). These cards held considerably more data than magnetic stripe cards and offered the capability to be written to (i.e., store data) during use. Today, the term Smartcard is often referred to in more generic ways including just the ability to store diverse information.

Some definitions are set by legislation or regulation and others have evolved from operators or suppliers.

#### [Player Card](#)

For the purposes of this report, we use the term **player card** to mean a physical card (such as a plastic card with a magnetic stripe), or a digital equivalent to a physical card (such as digital wallet). After a person has satisfied the registration criteria for a player card gaming application, they are issued a player card encoded in such a way that their registered identity can be read or retrieved from the player card. A player card and player card reader are the mechanisms used to identify a person at a device.

Player cards can take many forms and offer varying capabilities, and these are expanded upon below.

Player cards generally have external data printed on the card at time of issuance that may include a card number, card holder name, and card expiry date.

#### [Player Card Data](#)

All player cards are required to store information which can be used, read, or

transmitted to a device/system to identify the player card holder.

The simplest form of **player card data** may be a photograph printed on a card, but in practice, the minimum player card data is an identity number that has a corresponding record in a system database where more complete details of the card holder are held (e.g., name, address, date of birth, etc.)

More capable player cards (such as those with large internal memory) may also store considerably more data than a simple identity number and this may also be updated in real-time based on player card usage.

#### [Player Card Reader](#)

For the purposes of this report, we use the term **player card reader** to mean a device attached to a point of gaming activity (e.g., in a gaming machine), or other service point where a player needs to be identified (e.g., a player information kiosk or service desk), which can receive player card data from a player card (e.g., reading data from a magnetic stripe, or receiving data transmitted from a digital device) and transmit this to a player card gaming application.

#### [Player Display](#)

For the purposes of this report, we use the term **player display** to mean a display device at a gaming machine that receives data from an interface device specific to messaging from a player card gaming application (e.g., a display device that is not a gaming machine display, or an area of a gaming machine display that is controlled by an interface device (such as picture-in-picture capability)). A player display may also incorporate a 'touch screen' overlay that allows the capture of patron inputs.

#### [Interface Device](#)

For the purposes of this report, we use the term **interface device** to mean an electronic component, typically installed within the cabinet of a gaming machine,

that interchanges information between a gaming machine communication port and a player card gaming application, and to manage data flow with attached peripherals such as a player card reader and a player display.

### Player Card Gaming Applications

The term **player card gaming application** is used in this report to mean an activity or process related to gaming, whereby it is necessary to identify a specific person using a player card.

### Player Gaming Data

For the purposes of this report, we use the term **player gaming data** to mean data or information generated by a gaming device when used by a person with a player card.

For example, in the case of a gaming machine, player gaming data may include details relating to amounts bet, amounts won, number of games played, and the total time a player card was used at a specific gaming machine.

## 2.2 Player Card Gaming Applications

In this report, a player card gaming application involves monitoring or measuring a person's gaming activity on or at a gaming device in real-time and performing functions related to that activity.

### Common elements

All player card gaming applications require:

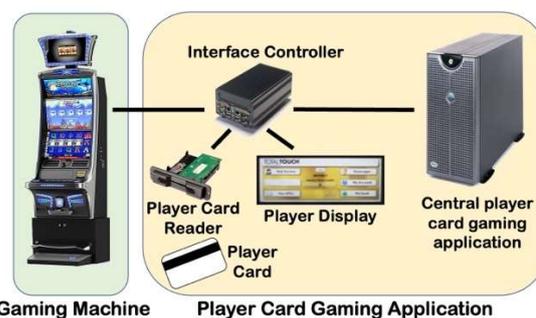
- a) a means to identify a person (i.e., player card);
- b) a means to associate that person with a particular gaming activity (e.g., a player card reader attached to a gaming machine);
- c) a means to monitor gaming activity (e.g., receiving gaming related data via a communications protocol implemented in a gaming machine); and

- d) a control system and database connected to gaming devices to perform specific functions of the gaming application (e.g., point accumulation for a loyalty scheme, or limit checking in a pre-commitment system).

### Card Readers and Player Displays not connect directly to Gaming Machines

It is not commonly understood that, apart from one international exception<sup>11</sup>, gaming machines do not have direct connection to peripherals such as a card reader or a player display.

Whilst card readers and player displays may be integrated into a gaming machine cabinet, they typically are connected to a specialised interface controller that can receive information from the gaming machine via the gaming machines communication port.



In most player card gaming applications, the gaming machine software has no knowledge of the presence or otherwise of a card reader or player card.

### Gaming machines do not operate player card gaming applications

Player card gaming applications fall into two general categories being gaming industry operated systems or systems adapted to Government mandated requirements.

Traditionally, player card gaming applications have been deployed by gaming operators in support of continually

but this protocol is not used in any gaming machines in Australia

<sup>11</sup> The International Gaming Standards Association G2S Gaming Machine protocol does support direct connection of a card reader to a gaming machine –



enhanced marketing and player retention initiatives.

The two most common forms of player card applications used by gaming operators are player tracking and card-based cashless gaming.

#### Player Tracking (Loyalty) systems

Player card gaming applications became popular amongst casino operators in the USA in the early 1990s with introduction of automated player systems for rewarding players for their activity on gaming machines.

Player tracking, also called gaming loyalty or loyalty systems, is now commonplace in casino gaming settings around the world, as well as large club gaming operations such as leagues clubs in New South Wales and Queensland.

The common feature across player tracking systems is recording gaming activity (at least wagers, amount won, and total time) whilst a player card is inserted into a gaming machine and using a formula to assign 'loyalty points' in proportion to game play (usually turnover, or wager amounts).

Today, player tracking systems are very sophisticated in functionality and capability including abilities such as:

- Assigning players to a 'tier level' based on their aggregate gaming activity;
- Offering differentiated reward amounts based on tier level; and
- Enabling the redemption of loyalty points at non-gaming outlets as a payment mechanism.

The key processes of a player tracking system are:

- Registration – where player identification details are collected and stored, and an identification number is allocated to identify that player;
- Player card issuance – where the identification number is encoded into a player card, typically containing a magnetic stripe; and
- Session tracking – where activity is tracked between the time a player card

is recognised at a gaming machine, and when it is subsequently removed or otherwise 'logged-off'.

#### Card-based Cashless Gaming

Card-based cashless gaming facilitates the transfer of credits to and from a gaming machine from an account stored in a venue based central player card gaming application.

Card-based cashless gaming functionality is typically incorporated into player tracking systems; however, several standalone card-based cashless gaming systems operate in smaller sized venues where player tracking is not offered; such as hotel gaming venues.

The operation of card-based cashless gaming is typically:

- A player registers to hold a venue account (note: accounts are held only at a gaming venue, and are not connected to external financial institutions);
- Money may be deposited into a player account via a cashier, or self-service terminal;
- At a gaming machine, a player inserts their player card into the card reader and the card identification number is transmitted to the central cashless system for verification (in some systems the player must also input a PIN using a keypad or touchscreen on the player display at the gaming machine);
- Menu options are presented, or available on the player display to request funds transfer to/from the gaming machine, and in most cases, the player can also select the transfer amount; and
- The transfer of credit amounts to/from a gaming machine is executed by the central cashless system using functions imbedded into gaming machine communication protocols. (This is an important distinction – funds are held in the central cashless system, not on the player card).



There have been bespoke card-based cashless gaming systems in the past (such as a system used by Sun International in South Africa) that utilised a smartcard (chip-in-card) to hold balances on the card and to transfer funds between the card and a gaming machine), however these had a short operational life and were eventually replaced by central systems that included better controls around player identification and player account management.

#### [Government mandated harm minimisation measures for Player Card systems](#)

Since the early 1990s in Australia, numerous state Governments have introduced legislation and regulation to incorporate player harm minimisation measures into the operation and availability of player card systems.

Common harm minimisation measures for player tracking/loyalty systems include:

- Provision of player activity statements detailing gaming expenditure and elapsed time using a player card;
- Provision of responsible gaming brochures to all participants;
- Limitation on the use of points accumulated in a player tracking system (including prohibition on the redemption of points for gaming credits); and
- Adequate identification of participants in a player tracking system.

Common harm minimisation measure for card-based cashless gaming include:

- Maximum account balances; and
- Maximum transfer amounts to/from a gaming machine.

### **2.3 Player Pre-Commitment Systems**

A Player pre-commitment is a system-based technology that allows gaming patrons to set time or money limits and to track their play.

Player pre-commitment was recognised in the Australian 1999 Productivity Commission report as a potential consumer control measure to direct

individuals and their actions in respect of gaming machine play.

As described in further sections of this report, player pre-commitment is a recognised and valuable tool, however its effectiveness requires participation and usage by gaming machine players.

#### [Key Elements of a pre-commitment system](#)

The key elements of a player pre-commitment system are:

- Enrolment/registration;
- Limit setting/amendment;
- Real-time gaming activity tracking;
- Limit progress reporting;
- Action on any limit being reached;
- Player information; and
- Jurisdictional requirements.

Player pre-commitment systems can be either:

- A stand-alone system not connected with any other player or player card scheme; or
- Part of an integrated system that may include, for example, a player loyalty scheme or a card-based cashless system.

Pre-Commitment enrolment/registration

Not all pre-commitment systems require or collect the same information at the point of player enrolment, and some systems permit anonymous participation where no details of the player are known or recorded.

In Victoria for example, Pre-Commitment Regulations<sup>12</sup> cater for Registered Players (where information such as name, address, email address is collected) as well as Casual card holders who can anonymously participate in pre-commitment by using cards that must be made available in each gaming venue.

The necessity for collection and storage of pre-commitment participant details is often dictated by legislative or operator rules such as:

- Should activity statements be mandatorily provided to participants, and if so, by what means;
- What level of identity verification must be performed before a pre-commitment enabled card can be reissued;
- What security provisions must apply (e.g., the mandatory setting of a PIN); and
- Is pre-commitment participation mandatory or voluntary?

At a minimum, a player pre-commitment system must create/issue a unique identification for each participant and facilitate a means for this to be encoded or stored on a Player Card.

Limit setting/amendment

A player pre-commitment system enables participants to set limits on total time or expenditure whilst gaming with their player card, and the period over which each limit applies – for example daily, weekly, or monthly.

In a player pre-commitment system operating under government direction (i.e., legislation or regulation), rules or requirements set out enforceable minimum limit types and limit periods; such as in the following table:

State	Minimum Limit Type & Periods	
	Time	Expenditure
Victoria <sup>13</sup>	Daily Weekly No Limit	Daily Weekly No Limit
NSW <sup>14</sup>		Weekly
Tasmania <sup>15</sup>		Annual

There must also be a facility for a player pre-commitment system participant to amend their current limit(s) if they choose.

In most regulated player pre-commitment systems, rules are enforced to allow immediate changes to limits that are reduced (e.g., an expenditure limit reduction from \$50 to \$20), and embargoed periods when a limit is relaxed (such as after 24 hours, or expiration of the current limit period).

Pre-Commitment gaming activity tracking

Gaming activity tracking in a player pre-commitment system relies on two key components; namely:

- a) how a participant is recognised at a specific gaming machine; and
- b) how data is received to monitor activity.

Participant recognition is achieved through a player card with a pre-commitment identification being ‘read’ by a player card

<sup>12</sup> *Gambling Regulation (Pre-commitment and Loyalty Scheme) Regulations 2014* (Vic)

<sup>13</sup> In Victoria, a person can set ‘no limit’ and simply track their time and/or expenditure

<sup>14</sup> For holders of cashless gaming accounts

<sup>15</sup> For participants in a Premium Player Program

reader device attached to a specific gaming machine.

As shown earlier, a gaming machine is generally unaware of the presence of a player card. Generally, the player card reader device communicates via an interface device at the gaming machine, which in turn communicates with a player card gaming application operating as a pre-commitment system host.

The diagram below depicts high level data flow and processing during game play.



When a player card is inserted into, or detected by, a player card reader device, player card data is 'read' and transmitted to the pre-commitment host system.

After verification of the player card data, the pre-commitment system sends the limit type(s) and value(s) set by that card holder as well as the current progress (amount used) towards each limit to the interface device in that EGM and a pre-commitment session is opened.

Monitoring and updating of any pre-commitment time limit(s) commences from the time a player card is read and verified until that card is removed from the card reader.

Progress towards any expenditure limits relies on real-time information wager amounts (aka turnover) received from a gaming machine. Gaming machines transmit wager amounts and other information via a built-in communications

protocol that is detected by the interface device installed in a gaming machine.

The interface device maintains real-time calculation of progress towards any limits.

When the player card is removed from the card reader, that pre-commitment session is closed, and the interface device transmits updated limit progress amounts to the pre-commitment host system.

Limit progress reporting

A pre-commitment system should include methods for reporting progress towards any limit to the player; however, some careful consideration should be given to the timing or actions that would trigger reporting, and how this is displayed.

Some pre-commitment systems provide limit reporting to a player whilst their card is inserted into a card reader at a gaming machine; for example:

- on player card insertion;
- periodically during play;
- upon reaching specified limit hurdles (e.g., 50%, 75%, 90%, etc.);
- on demand (i.e., player request); and
- on player card removal.



Some pre-commitment systems utilise a 'picture-in-picture' capability to interact with the EGM main video screen as an alternative to a separate player display.

Whilst this has the advantage of reducing capital costs and presenting data that is more likely to be seen by a player, there are some downsides depending on the technology used as some picture-in-picture system utilise a relatively large proportion of the video screen and images/messaging intended for a single player can be easily observed by nearby customers.



Participants in player pre-commitment can/should also be able to view their limit status at other points away from a gaming machine such as an in-venue player information kiosk or via an internet connection to the pre-commitment system host.

#### Action on any limit being reached

Pre-commitment systems must be able to enforce predefined actions when any limit is reached during a pre-commitment session; including any combination of:

- Alerting the player with messaging on the player display and/or audio prompt (e.g., 'ding' sound);
- Disabling the gaming machine from further play while that player card remains in the card reader;
- Stopping loyalty point accumulation; and
- Alerting venue staff for possible intervention.

Systems must also include actions to cater for when a card is inserted into a card reader at an EGM where one or more limits have already been reached.

#### Player Information

Player pre-commitment systems should provide up to date information to card holders including:

- Current limit types & amounts;
- Progress towards all limits; and
- Historical activity statements including summaries of time and expenditure at individual venues and statewide totals (where a statewide system is enforced).

Preferably participants should have the option to select their individual access method to their pre-commitment data by means including:

- Email delivery;
- Internet access to the pre-commitment host; or
- In-venue kiosk or player information terminal.

System prompts should be incorporated to alert a participant to the availability of their pre-commitment data including on-screen messages when a card is inserted into a card reader at a gaming machine, or via text messaging to a mobile device.

#### Jurisdictional Requirements

Player pre-commitment systems should include flexibility to cater for different jurisdictional requirements, which may also change over time.

Whilst the underlying concept of pre-commitment monitoring remains the same across most jurisdictional settings – that is, setting limits and tracking gaming activity – legislated or operational requirements of a specific jurisdiction can impact functionality, implementation timeframes and cost (capital and operating).

Perhaps the most significant impacting factor on a pre-commitment system is a jurisdiction requirement to operate a statewide system where a player can use the same player card at any venue in the State and their pre-commitment limit status 'follows them' and is accessible in real-time regardless of venue location.

A statewide system also imposes increased reliance on wide area network connectivity between the pre-commitment host and gaming venues.

The diagram below summarises other common jurisdictional requirements which need to be determined by Government or regulators.

<b>Voluntary player card</b>	<b>or</b>	<b>Mandatory player card</b>
<b>Venue-based</b>	<b>or</b>	<b>Statewide</b>
<b>Partial Pre-comm</b>	<b>or</b>	<b>Full Pre-comm</b>
<b>Anonymous &amp; Registered</b>	<b>or</b>	<b>Registered cards only</b>
<b>No Max EGM hrs</b>	<b>or</b>	<b>Maximum EGM hrs</b>
<b>Service provider</b>	<b>or</b>	<b>LMO Operated</b>

## 2.4 Pre-Commitment as a Harm Minimisation Measure

Player pre-commitment is a consumer measure designed to allow individuals to control their activity at gaming machines.

Effectiveness of pre-commitment requires the combination of technology that allows players to set limits and monitor their activity, and player take-up and usage of the capability.

### Technology impact on pre-commitment effectiveness

From a technology perspective the effectiveness of pre-commitment relies upon factors such as:

- Ease of use including card issuance/registration and ‘at EGM’ experience;
- Available limit types;
- Player card technology;
- Serviceability of card reader and player display at EGM (a very significant factor where EGMs must remain disabled until a pre-commitment card is inserted); and
- Status and messaging format and content.

### Non-technical factors impacting the effectiveness of pre-commitment systems

Researchers in the field of gambling harm minimisation are best placed to discuss the effectiveness of the reduction (actual or potential) of harm from using pre-commitment systems; however, we do offer the following opinions.

**Effectiveness:** Should effectiveness be measured by overall participation rates (i.e., across a community or State) or only the impact on those persons engaged with, and actively using, pre-commitment functions?

This debate continues in Victoria after the State mandated pre-commitment technology on all EGMs whereas participation is voluntary.

In Victoria, gaming operators spent in the order of \$60m to install pre-commitment technology into approximately 27,000 EGMs and incurred a significant increase in monitoring fees to assist in the recouping of development costs of the Monitor. A report commissioned by the Victorian Department of Justice and Community Safety <sup>16</sup>found that “the system had been implemented successfully, but it was not a success”. This reflects extremely low participation rates in the Victorian pre-commitment system.

**Default Limits:** Should default pre-commitment limits be prescribed? This is topical amongst some commentators, however; in Victoria, a ‘no limit’ option allows players to track their play and receive statements, and for the Government to receive player usage data, without setting a limit.

Prescribing default limits offers the advantage of faster enrolment into a pre-commitment system whilst retaining the ability for a participant to edit their limits at a later time.

**Maximum Limits:** Should there be maximum limits? Another topical question

<sup>16</sup> Evaluation of YourPlay Final Report, South Australian Centre for Economic Studies, March 2019

which also attracted discussion during the recent Victorian and Western Australia Royal Commission in the Crown casinos in Melbourne and Perth respectively and its Operator Licenses.

The Victorian Royal Commission<sup>17</sup> and the Western Australia Royal Commission<sup>18</sup> set out the following recommendations in respect of player cards and pre-commitment for EGMs at Crown Casino properties.

Requirement	EGMs at Crown Melbourne Casino	EGMs at Crown Perth Casino
Player Card	Mandatory	Mandatory
Pre-commitment	Full	Full
Limits	Daily, weekly, monthly Loss & Time	Weekly Loss & Time
Maximum hours EGM gambling	3 hours without a break  No more than 12 hours total in a 24-hour period  Maximum 36 hours per week	3 hours without a break  No more than 12 hours in a 24-hour period  Maximum 28 hours per week
Loss limit	Default limit to be set	Prescribed default loss limit and a maximum loss limit.  Players may apply for an increase

## 2.5 Pre-Commitment System Implementation Considerations

As described earlier, implementation of a pre-commitment system in Tasmania must reflect decisions or directions set by the Minister or Commission.

An earlier section of this report (Consultant Opinion Relative to Player Pre-commitment) details our opinion on pre-commitment jurisdictional settings and phasing. The following sections discuss some of the key considerations that were explored.

### Voluntary Vs Mandatory Participation

This is a key decision.

Mandatory participation would mean that a gaming machine could not be played (e.g., in a disabled from play state) unless a pre-commitment player card was inserted into the card reader at that machine, and that no limits have been reached.

All players, regardless of where they are domiciled, would be treated the same (i.e., require a player card), regardless of their susceptibility to harm from gaming machine play.

When a pre-commitment player card is removed from the card reader at an EGM, that EGM would be required to revert to a disabled state.

Disabling/enabling of EGMs in Tasmania is technically possible today via the QCOM gaming machine communication protocol, however investigation would be needed to understand what, if any, messaging is available to inform a potential player about the EGM state, and whether credits could be added and/or removed from an EGM in a disabled state.

Voluntary participation would mean that all gaming machines are always available for play whether a pre-commitment card is use at a particular machine. (See also 'action on limit' below)

<sup>17</sup> Report of the Royal Commission into the Casino Operator and Licence, Volume 1 (October 2021)

<sup>18</sup> Perth Casino Royal Commission, Final Report, March 2022



### Statewide or Venue-based participation

This is a key decision with a technical impact on a pre-commitment system, implementation cost, and potentially, operational costs.

Statewide participation means that a pre-commitment participant is only required to register and set limits once, and their player card and current status is accessible at all venues across Tasmania.

Similarly, in a statewide system, reaching a limit in one venue would 'follow' a participant if they attempted to use their player card at another venue.

A single pre-commitment host would be required to communicate to all gaming machines in all venues.

Venue-based participation means that a pre-commitment system is managed at a venue level only and in the event a person played at two or more venues, they would most likely need registration in, and a player pre-commitment card issued from each venue.

Venue-based pre-commitment also means that a person's limit status (i.e., limit reached or not, and remaining time/loss to limit) would not be available at any other venue and thus a person could potentially engage in gaming machine play whilst being in a 'limit reached' status at another venue.

Such a situation could easily occur in towns or regions where multiple gaming venues operate and moving from one venue to another is a relatively simple proposition.

It is possible to conceive a system where venue-based pre-commitment systems are connected to a central host (such as the Monitoring Operator's EMS) where pre-commitment status is exchanged on an "as-needed basis" – but this is only a hypothetical proposition today.

There may also be consideration that Statewide pre-commitment excludes casinos.

The technical impact of a requirement for Statewide pre-commitment is a higher reliance on wide area network availability and potentially additional technology components (such as site controller or communicator) required in each venue.

The most obvious provider of a Statewide pre-commitment system is the Monitoring Operator who, under the terms of their licence is required to implement an EMS that could be adapted to incorporate pre-commitment functionality.

Regardless of the pre-commitment system operator, all EGMs would need to be modified to incorporate a player card reader, player display and interface device.

### Mandatory setting of limits

Should it be mandatory to set at least one limit?

This question is impacted by the earlier question on mandatory or voluntary participation in pre-commitment.

Some pre-commitment systems, such as legislated in Victoria, allow a participant to set a limit type (e.g., loss or expenditure) without setting a limit value. This provides the utility to the participant to simply track their activity, including pop-up messaging reporting time and expenditure.

### Anonymous participation

This is a key decision with a technical impact on a pre-commitment system, and potentially, operational costs.

Anonymous participation in pre-commitment allows a person to set limits and track their play on gaming machines without needing to disclose any identifying information.

The alternative obviously requiring the collection of information such as name and contact details (e.g., email, mobile phone) and possibly requiring positive



player identification (e.g., identity match with a government issued identifier such as a driver's licence or Medicare card).

An obvious operational consideration is how a person obtains an anonymous pre-commitment player card? In Victoria, venue operators are required to have at least 20 casual cards (i.e., anonymous) available for collection at cashier booths and other player service points.

This point is also impacted by the earlier question on mandatory or voluntary participation in pre-commitment.

Theoretically an anonymous participant could simply collect a new (different) anonymous card in the event that are precluded from playing after reaching a limit.

#### [Limit Types and Defaults](#)

Consideration must be given to the minimum limit types that must be implemented in a pre-commitment system and whether default limit values should be set.

Options for limit types are time and/or expenditure, and for each limit type it should be possible to set one or more limit periods (e.g., per day, per week, annually).

A further consideration for each limit type is the necessity for default limits and maximum limits.

#### [Action on limit reached](#)

Where participation in pre-commitment is mandatory, the action on reaching a limit is simply to not permit any further gaming with that player card until the expiration of the limit period, or another regulated/directed value.

In a voluntary participation setting, consideration must be given as to what the pre-commitment system must do. For example:

- Alert the player that a limit has been reached;
- Continue alerts at a higher frequency if the player card remains in the card reader;
- Cease any further accumulation of loyalty points;
- Alert the player each time their player card is inserted into a card reader at an EGM; and
- Send messages to venue staff for intervention.

#### [Pre-commitment system provider](#)

Pre-commitment systems are available from multiple vendors.

In our opinion, the most obvious provider is the Monitoring Operator who is already required to interface to each gaming machine and operate an EMS that connects all gaming venues to a Central EMS Host.

Notwithstanding potential duplication of in-venue and possibly, central infrastructure, it is possible that a third-party service provider(s) could facilitate a pre-commitment system.

Without responsibility for pre-commitment system operation, the Monitoring Operator would not be motivated to install a player card reader and player display at each EGM, and depending on the Monitor's EMS, there may also be no need for an interface device in each EGM.

On the other hand, to receive real-time data from an EGM, it is most likely that a third-party service provider would require an agreement from the Monitoring Operator, and an interface into the EMS.



### Pre-Commitment player card technology

Consideration should be given to the choice of pre-commitment player card technology.

By far the cheapest and simplest player card technology is a plastic card with a magnetic stripe capable of storing data encoded on track 2. This type of card is commonplace amongst player tracking, card-based cashless and older ATM/bank cards, however, the carriage of cards by the general public is reducing in line with more widespread use of mobile phones with embedded digital wallet capability.

The reason for including this topic for discussion is that ideally, the choice of player card and related technologies will continue to be available and economical over a long operational life.

Appendix 1 of this report discusses differences in available player card (and corresponding card reader) technologies.

### Gaming activity sessions

Fundamental to being able to conduct pre-commitment gaming machine activity tracking (time and expenditure) is the need to associate the correct participant with that gaming machine.

Activity tracking starts with a 'card-in' (or equivalent) and concludes with a 'card-out' (or equivalent) – this is known as a 'session'.

Appendix 1 to this report outlines attributes of potential player card technologies for use in pre-commitment systems, including obstacles for reliably allocating gaming machine activity to a specific pre-commitment participant.

### Integration with other player card applications

It is technically possible that player pre-commitment functionality may be incorporated into other player card gaming applications such as player tracking or card-based cashless gaming.

From a player perspective combining functionality via one player card may

assist with participation in pre-commitment.

From a venue operator perspective, they may desire to offer multiple functions to a player card holder, and thus there must be a means to access multiple systems from a single player card reader at a gaming machine.

This is common in other jurisdictions, but often requires the cooperation of multiple system vendors and oversight by the Regulator to ensure prioritisation of pre-commitment messaging and alerts.

### Commission Pre-commitment System Technical Standard

In our opinion the Commission should set a technical standard for a Pre-commitment System.

The standard should reflect decisions or directions resulting from earlier points in this section (such as limit type, limit period, and action on limit being reached), as well more generalised technology standards such as:

- Access control and security;
- Interfacing with the EMS or gaming machines;
- Player card specification; and
- Player display minimum requirements.

### Pre-commitment system ability to detect excluded persons

Theoretically, a pre-commitment system could be developed to attempt to detect gaming by excluded persons, however, this would require a significant level of integration with exclusion management systems and depending on the pre-commitment operational requirements (such as mandatory player card use) may still be open to degrees of inaccuracy.

The most obvious source of inaccuracy would be an excluded person using another person's player card.



Without some form of biometric identification, no player card system can positively match a card user with the individual that card is registered to.

Where anonymous card use is permitted, there is no capacity in a pre-commitment system to detect a card issued to an excluded person.

On the other hand, if player cards are mandatory, there could be an enforceable obligation on Venue operators to require positive identification at the point of pre-commitment player card registration. At this point in time, the Venue Operator could confirm that an applicant is not an excluded person.

A further enforceable obligation on a Venue Operator could be that upon receipt of exclusion notification for a person, a player card associated with that person could be disabled.

A system-to-system automated verification of an applicant's exclusion status could be contemplated, and this could theoretically be extended to check on exclusion status each time a player card is detected at a gaming machine.

Before pursuing such an option, consideration should be made of the cost-benefit of such a requirement. A practical alternative for detecting the potential presence of an excluded person would be the implementation of FRT Systems in venues.

## 2.6 Pre-Commitment System Implementation Risk

### Potential technical risk

From a technical perspective, implementation of pre-commitment technology for gaming machines is a low-risk activity.

Clear specifications including business and functional specifications should be developed and include final decisions on matters raised earlier in this report, and directions from the Minister or Commission.

An early decision on the preferred pre-commitment system supplier/operator is essential – particularly if or more system providers are permitted and integration with the Monitoring Operator and their EMS is required.

### Potential commercial risk

From a commercial perspective, costs associated with the provision of a pre-commitment capability, and who is responsible for such costs is a significant issue that will need to be addressed with venue operators.

In Victoria for example, Statewide pre-commitment was introduced after the commencement of a Monitor, and venues were required to pay capital costs for card readers and displays at EGMs (circa \$1,200 per EGM) plus an increase of circa 60% in the Monitoring Fee (to cover system development costs of the Monitor and expected increases in service desk manning levels). Venues were also required to acquire and install pre-commitment player kiosks, card encoders and ongoing provision of pre-commitment player cards.

### Potential political risk

From a political perspective we would anticipate different level of risk depending on decisions such as Mandatory versus Voluntary participation in pre-commitment. In 2012 when the Federal Government committed to the introduction of mandatory pre-commitment for gaming machines, there was enormous and coordinated industry campaigns against this that ultimately forced the Government to abandon this requirement.

## 2.7 Pre-Commitment System Indicative Cost and Next Steps

Complete costs for the implementation of a player card pre-commitment system require direction on many of the jurisdictional considerations outlined previously.

Planning for budgetary pre-commitment costs and implementation budgets requires consideration of, mostly, non-technical matters such as:

- a) Regulatory impact including determining jurisdictional settings;
- b) Impact on gaming machines and EMS;
- c) Commission rules, standards, and guidelines;
- d) System design; and
- e) The potential phasing of jurisdictional requirements that may enable the collection of baseline data and research to further inform limit setting requirements.

Nevertheless, in our opinion the technical aspects of a pre-commitment system could be developed within a 24- to 30-month timeframe.

The development effort would include detailed business requirements, user experience (e.g., interfaces, messages, and website), modification of the Central EMS Host and Venue EMS Host software, and certification testing.

We believe a pre-commitment capability could be available on all gaming machines in hotels and licensed clubs in Tasmania for an outlay in the order of \$10m.

We have not canvassed detailed estimates from system vendors, however based on corresponding costs for player card readers and interface devices in Victoria (approx. \$3,200/EGM) and an estimated EMS development budget of \$2m we believe this to be an achievable overall budget.

## RELEVANT ACTIVITIES IN OTHER STATES

In New South Wales, the gaming regulator<sup>19</sup>, through its Regulatory Sandbox process, is overseeing a process for trials of digital wallet technologies for gaming machines.

These trials are intended to test the use of digital wallet as a mechanism for funding and operating accounts to facilitate play on gaming machines.

Trials have been approved for several gaming system vendors and final requirements relating to mandatory parallel research are presently being finalised.

Trials are expected to commence by July 2023 and run for at least 6 months.

In Victoria, the Government has accepted the recommendations of the Royal Commission<sup>20</sup> into the Casino Operator and Casino Licence.

These recommendations included significant measures impacting the use of gaming machines at Crown's Melbourne Casino, including the mandatory requirement for player cards, mandatory full and binding pre-commitment and universal limits on elapsed time whilst playing gaming machines.

The Government is yet to set a timeframe for implementation of these recommendations, however enabling legislation is expected to be introduced into the Victorian Parliament during 2022.

No indications have been given about a wider application of these requirements across gaming machines in hotels and clubs in Victoria; however, many commentators believe this will follow in due course, perhaps coincidental with the process for appointing a Monitor at the conclusion of the current licence in August 2027.

In Western Australia, the Government has recently received a report from the Perth Casino Royal Commission<sup>21</sup>.

This report has recommended significant harm minimisation measures with many similarities to the Victorian Royal Commission.

---

<sup>19</sup> Liquor & Gaming NSW, part of the Better Regulation Division of the NSW Department of Customer Service

<sup>20</sup> Report of the Royal Commission into the Casino Operator and Licence, Volume 1 (October 2021)

<sup>21</sup> Perth Casino Royal Commission, Final Report, March 2022

## APPENDIX 1: DIFFERENCES IN PLAYER CARD TECHNOLOGIES

### Introduction

The choice of player card technology has a fundamental impact on a pre-commitment system in terms of cost and participant experience.

Player card and player card reader technologies are obviously coupled and must be considered together in overall system cost. It must also be noted that, for the most part, one form of player card technology cannot interact (e.g., be read by) a different card reader technology.

This has an implication over a long life and may constrain the ability to introduce newer technologies.

For example, migration from a magnetic stripe player card to a digital wallet-based player identifier would necessitate steps including:

- Determine if the pre-commitment Interface Device can receive inputs from a magnetic stripe card reader and an NFC/BLE reader;
- Determine digital wallet application functionality – such as discrete App, the ability to use an on-device wallet, player interface, how to connect a player and manage a ‘session’ for pre-commitment tracking purposes;
- Software and hardware modification to the Interface Device to receive and process inputs from multiple card reader technologies;
- Determine interfacing capabilities between a pre-commitment system and a digital wallet App; and
- Potential migration of pre-commitment participant settings and data into a digital wallet App

Potential player card technologies suitable for pre-commitment are discussed in more detail below, including basic utility, current usage, and known implementation issues.

### Magnetic Stripe Card

**The technology basics:** Plastic cards with a magnetic stripe for (very limited) data storage is amongst the cheapest and most widespread form of data card –

common in many consumer applications since the 1970s.

ISO 7811 standard defines the format and requirements for magnetic stripe cards, but short, a magnetic stripe has the following attributes:

- In theory 3, but today typically only 2 ‘tracks’ that can be encoded
- Track 1 can store up to 79 alphanumeric characters
- Track 2 can store up to 40 numeric and special characters (0-9, and : ; < = > ?)

As shown above, magnetic stripe cards have an extremely limited data storage capacity, and in practice provide only an identifier that connects a card holder to other data stored in a larger application and database.

The data encoded onto a magnetic stripe can be read by a card reader with a ‘read head’ over each track as the card holder swipes the card through a swipe reader or inserts the card into an ‘insertion type’ card reader.



**Ease of use:** A standout attribute of a magnetic stripe card is simplicity and ease of use.

**Vulnerability:** Most users of a magnetic stripe hotel room card would have experienced, or heard of, cards becoming inoperable after contact with a mobile phone. This is related to the quality of the magnetic stripe which is expressed by the term ‘coercivity’. Low coercivity magnetic stripes are cheap and most often used when reissue is likely (such as a hotel room access card) but are highly susceptible to magnetic interference, whereas high coercivity cards are more

expensive but far less susceptible to loss of data from mobile phones (e.g., financial institution issued cards).

**Limited data storage:** In gaming settings where the presence of a card holder must be continuously confirmed (such as for loyalty tracking or pre-commitment purposes), insertion type readers are the norm. However; because the entire length of the magnetic stripe cannot be read, the effective (or usable) data size is reduced to almost half (e.g., an insertion type card reader can only read 22 or 23 characters from track 2).

**Usefulness in a pre-commitment system:** Magnetic stripe cards are well suited as player cards in a pre-commitment system.

Benefits include:

- Low cost (cards and card readers)
- Widespread, long-term public use
- Intuitive for most participants
- Operational in gaming loyalty applications
- The card-in/card-out action of insert style card readers are ideal for session tracking

Some downsides include:

- Diminishing carriage of cards by the public
- Longevity of supply? (e.g., Mastercard will not be issuing mag stripe cards from 2033)

### Smartcard

**The technology basics:** A smartcard is a typical bank card size plastic card with an embedded integrated circuit chip, sometimes referred to as chip-in-card devices.

ISO 7816 standard includes specifications for smart physical attributes, electrical interfaces, and communication protocols.

A modern smartcard can store at least 256KB of data and smartcard technology permits two-way data exchange, meaning the data can be written to, or stored on a card, by an application in real time.

Data is read from and written to a smartcard via a card reader capable of communicating with a smartcard. Note: in a retail setting it is common to see a magnetic stripe card and smartcard reader in the same physical device, but each card technology is supported by a separate reader mechanism in that device.

Data on a smartcard can be protected via simple PIN mechanisms or more complex and secure, encryption algorithms.



**Ease of use:** Smartcard technology is easy for a card holder to use.

**Off-line capability:** One of the key attributes of smartcard technology is the ability to operate in 'off-line mode' – meaning, depending on the system application, a card can be used without the need to communicate with a control system.

For example, in South Africa in the early 2000s, a smartcard-based cashless system operated for gaming machines where the card maintained a cashless account including balances and full transaction details and was able to send

credits to/from a gaming machine without needing to be in contact with the host cashless system.

This off-line mode enabled the use of cashless without the complexity of a gaming floor network, but it was vulnerable to potential manipulation of card balances before details could be synchronised with the central system.

### Usefulness in a pre-commitment

**system:** Smartcards as a player card in a pre-commitment system offers some very attractive capabilities to a pre-commitment system but adds a complication if other player card gaming applications are intended to be operated.

Benefits include:

- The ability to store very large volumes of data on the card (e.g., multiple limits, limit tracking status, security details, card holder details – all in an encrypted environment)
- Reduce or remove the reliance on the Monitoring Operator and their EMS
- The potential to operate pre-commitment without gaming floor or wide area networks (by operating on 'off-line' mode)
- The card-in/card-out action of insert style smartcard readers are ideal for session tracking

Some downsides include:

- All player card gaming applications (e.g., gaming loyalty) would need to use the same smartcard and Interface Device because a gaming machine *should/must* have only one card reader and one Interface Device
- Cost of smartcards and readers
- A network connection is probably still required to each Interface Device in a gaming machine to enable future download of new messaging and pre-commitment software
- Diminishing carriage of cards by the public
- Potential for data corruption if 'off-line' mode is permitted

### RFID card

**The technology basics:** RFID cards have an embedded RFID chip and antenna that allows data transfer to an RFID reader using radio frequency waves.

Most people would be familiar with RFID card technology via contact less (aka tap-n-go) bank cards.



RFID/ Contactless/ Tap-n-Go

ISO 14443 standard includes specifications for operating frequency ranges for different RFID implementations and communications protocols for transmitting data.

The simplest, and thus cheapest RFID cards have an immutable serial number written into the card at the time of manufacture (i.e., a permanent card ID) and it is not possible to write data to the card.

More complex cards have a 'write once, read many' (WORM) capability where a user application can write a card serial number once only into the card, or the ability to continuously write data to the card.

RFID cards do not require a battery, the embedded chip is energised through transmission energy emitted by an RFID reader.

**Ease of use:** RFID card technology is easy to use for card holders but can be complicated for an operator depending on the type of card used (for example, recording the card serial number from a read-only RFID card and assigning this to an identity record).

**Low data storage:** Unlike a smartcard, RFID cards have low storage capacity (typically 2KB) and transmit data at relatively low transmission rates.

**Not prone to session tracking:** Unlike magnetic stripe or smartcard technologies which use card readers that typically expect or require a card to remain in the reader during activity (such as a loyalty session on a gaming machine), RFID card technology is not well suited to 'holding' a card during an activity session.

The radio frequency aspect of RFID enables card readers to be housed behind panels or other coverings and card users are directed to a 'tap-zone'.

**Close proximity card detection range:** The detection range (minimum distance between card and reader) for RFID cards is dependent on the card type. In a typical retail use, cards must be within 1 to 4cm of the reader (also a security feature), whereas in high frequency, active cards, a reader can detect a card at distances over 40m.

Clearly in a gaming setting, close proximity detection is required to properly associate a card (i.e., person) at a specific gaming machine.

**Usefulness in a pre-commitment system:** RFID cards as a technology for player cards in a pre-commitment system presents more barriers than benefits.

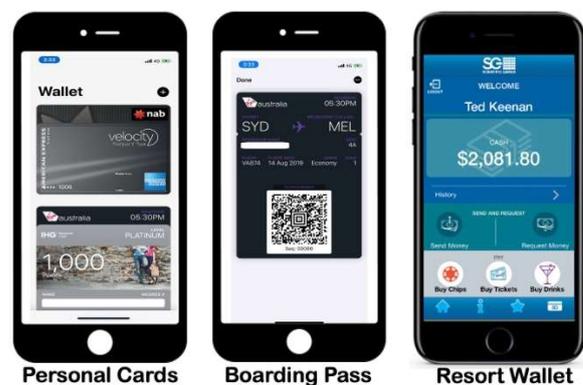
Some downsides include the likelihood that all player card gaming applications (e.g., gaming loyalty) would need to use the same RFID card and Interface Device because a gaming machine *should/must* have only one card reader and one Interface Device, and the diminishing carriage of cards by the public.

By far the biggest downside is the likely complication of creating an activity session where the activity of card holder can be accurately measured.

### Digital Wallet

**The technology basics:** Digital wallet is a generic term for the ability to hold digital equivalents of physical cards/forms in a medium that allows access and functionality as if the physical card/form was used.

The most common implementation of digital wallet is in a mobile phone that can either access a 'wallet' controlled by the phone issuer (e.g., Apple wallet) or a software application (App) enabled for use on a mobile phone.



Depending on the mobile phone manufacturer, or Apps running on a phone, communication from phone to a reader device can be either Near Field Communication (NFC), Bluetooth or wireless via the internet.

**Ease of use:** General public usage of digital wallets is becoming more commonplace however onboarding for many users ranges between complicated and intimidating.

The most common and widely understood use of digital wallets is as a payment mechanism that replicates the tap-n-go utility of an RFID card; however, the COVID-19 pandemic has introduced many users to phone based Apps (e.g., Check in TAS) where users have become comfortable with entering identifying information via a mobile phone screen.

**Not prone to session tracking:** Unlike magnetic stripe or smartcard technologies which use card readers that typically expect or require a card to remain in the reader during activity (such as a loyalty session on a gaming machine), digital wallet technology is not well suited to 'holding' a card during an activity session.

Gaming machines have no easy 'placeholders' for phones and very few customers would be willing or comfortable to leave their phone sitting on a panel on a gaming machine.

Using a mobile phone to emulate the card-in or card-out steps of a physical card is clumsy and not intuitive.

**Close proximity detection range:** The detection range (minimum distance between mobile device and reader) for mobile phone digital wallets is very small and similar to RFID cards - within 1 to 4cm of the reader.

Clearly in a gaming setting, close proximity detection is required to properly associate a card (i.e., person) at a specific gaming machine.

**Usefulness in a pre-commitment system:** Digital wallet Apps can enable and potentially enhance the pre-commitment registration process. Apps provide an opportunity for enhanced privacy and the ability to perform functions outside of a gaming setting.

Status and other player information can also be delivered in more discrete ways using email or internet prompted messages that a participant can access at convenient times and locations.

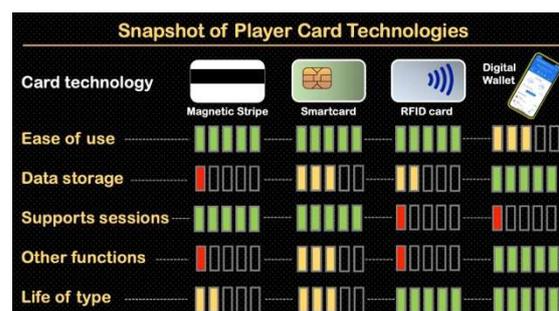
Digital wallet Apps also provide similar capabilities to off-line smartcards whereby pre-commitment, for example, could be implemented using internet connectivity rather than a gaming floor network system.

By far the biggest downside is the likely complication of creating an activity session where the activity of card holder can be accurately measured.

Another complication/difficulty with mobile phone based digital wallets is the difference in accessible communication capability that would be needed for consistent use across all participants. Apple, for example, tightly control access to their NFC command suite, whereas Google and their Android OS makes NFC more accessible to Apps.

[Player card technology comparison and consultant opinion](#)

The diagram below presents a comparison of potential pre-commitment player card technologies discussed in this appendix.



The colour coding is intended to portray a 'rating' of each technology against key features necessary for successful implementation of pre-commitment.

No actual scale or measurement has been applied.

A 'red' rating is poor or low, 'yellow' indicates improvement, and 'green' is intended to represent a high or rating.

**Ease of use** relates to usability by a pre-commitment participant.

**Data storage:** relates the amount of data capable of being stored on the card.

**Supports sessions** relates to a well-established and proven ability to accurately track a session of gaming activity with that card technology.



**Other functions:** relates to other applications or functions capable of being executed from the card technology.

**Life of type:** relates to expectations of very long availability in a commercial setting.