UDC 005.4:656.025.4/.6:656.073.5 **DOI https://doi.org/10.33082/td.2022.3-14.04**

ESTABLISHMENT OF RISK-ORIENTED API/PNR PROGRAMME MODEL FOR EFFECTIVE PASSENGER CONTROL ON INTERNATIONAL FLIGHTS

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Summary

Introduction. *Continuous growth in the number of passengers on international flights increases customs authorities and other relevant agencies need to be prepared to handle the number of passenger without harming the speed of the passengers flow through the air border checkpoints. Responding to this increase, the use of modern technology and greater domestic and international cooperation can enhance the effectiveness of customs control and assist customs to more efficiently cope in preventing the cross-border movement of terrorists, threats arising out of the terrorist activity, prevent dangers to national security. Incorporating passenger selection/screening criteria based on high-quality risk indicators and advanced passenger information has proven to have a positive effect on enforcement activities.* ***Purpose.*** *The purpose of the research is to develop risk-oriented Advance Passenger Information and Passenger Name Record (API/PNR) programme model for effective passenger control.* ***Results.*** *It was found that successful establishment and utilization of proposed risk-based conceptual model of Advance Passenger Information (API) and/or Passenger Name Record (PNR) in Azerbaijan offer the following benefits for the involved parties: simplification and facilitation of existing procedures; reduction or elimination of unnecessary passenger control measure; access to the risks, fulfil targeted controls and provide pre-clearance of the flights; establishment of a risk-based model for Border Control Management; improvement and determination of the ways to overcome the challenges faced in matters related to identification and risk management systems; increase of awareness of the interested government bodies with the further possibilities more effectively address potential threats targeting national security.* ***Conclusions.*** *Advance Passenger Information and Passenger Name Record data play an important role in identifying the risks because it allows customs authorities to carry out targeted and risk-based control, which helps to detect and prevent a number of serious transnational offenses while maintaining data protection and privacy.*

Key words: *risk management, customs service, advance passenger information, passenger name record.*

СТВОРЕННЯ РИЗИК-ОРІЄНТОВАНОЇ МОДЕЛІ ПРОГРАМИ API/PNR ДЛЯ ЕФЕКТИВНОГО КОНТРОЛЮ ПАСАЖИРІВ НА МІЖНАРОДНИХ РЕЙСАХ

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Анотація

Вступ. *Постійне зростання кількості пасажирів на міжнародних рейсах збільшує навантаження на митні органи та інші відповідні органи, які повинні бути готові обробляти всю кількість пасажирів без шкоди для швидкості пасажиропотоку через повітряні пункти пропуску. У відповідь на це зростання використання сучасних технологій і розширення внутрішнього та міжнародного співробітництва може підвищити ефективність митного контролю та допомогти митницям ефективніше боротися із запобіганням транскордонному переміщенню терористів, загрозам, що виникають внаслідок терористичної діяльності, запобіганню контрабанді, торгівлі наркотиками та іншим загрозам національній безпеці. Доведено, що включення критеріїв відбору/перевірки пасажирів на основі високоякісних індикаторів ризику та розширеної інформації про пасажирів позитивно впливає на діяльність по ефективному контролю за переміщенням осіб через кордон.* ***Мета.*** *Розробка ризик-орієнтованої моделі програми попередньої інформації та запису даних про пасажирів (API/PNR) для ефективного контролю.* ***Результати дослідження.*** *Було встановлено, що успішне впровадження та використання запропонованої концептуальної моделі попередньої інформації про пасажирів (API) та/або запису даних про пасажирів (PNR) в Азербайджані має наступні переваги для залучених сторін: спрощення і полегшення існуючих процедур контролю та оформлення; зменшення або скасування непотрібних заходів контролю пасажирів; доступ до ризиків, здійснення цільового контролю та надання попереднього дозволу на рейси; створення моделі управління прикордонним контролем на основі оцінки ризиків; вдосконалення та визначення шляхів подолання викликів, що виникають у питаннях, пов'язаних із системами ідентифікації та управління ризиками.* ***Висновки.*** *Попередня інформація про пасажира та запис даних про пасажирів відіграють важливу роль у визначенні ризиків та дозволяють митним органам здійснювати цілеспрямований контроль, що ґрунтується на оцінці ризику, що допомагає виявити та запобігти низці серйозних транснаціональних правопорушень, зберігаючи захист даних і конфіденційність.*

Ключові слова: *управління ризиками, митне обслуговування, попереднє інформування пасажирів, запис даних про пасажирів.*

Introduction. Azerbaijan Customs Service (ACS) is developing dynamically and moves ahead confidently as an organization aiming continuously implement international standards to achieve world-class quality of services. Azerbaijan Customs

Service pays special attention to the application of IT systems and technologies which facilitates the movement of the goods, passengers and means of the transport and simplifies the border crossing procedures.

According to statistics [1] number of passengers boarded by the global airline industry has reached ported 4.7 billion passengers globally in 2020. It is estimated that the global volume of air passengers grows at a rate between 5% and 7% every year and could reach 7.2 billion by 2036.

The traditional Customs inspections based mostly on selective methods of Customs control, behavioural analysis, questioning, baggage surveillance and etc. is no longer sufficient to control increasing risks and threats. Simultaneously Customs authorities around the globe, face major challenges in balancing a country's need for controls with the benefits of facilitating cross-border traffic of people and their goods. One of the most challenging tasks for an Administration is the mitigation of the risks associated with the movement of people across its borders. In most cases administration has only a short time to make a decision whether the person is a high or low risk while managing high volume of travellers. The task is further complicated by the large number of means of transportation that are used, including commercial aviation, general aviation, commercial vessels, cruise ships, trucks, automobiles, train, and on foot.

Problem setting. Investing in risk management solutions based on advance information as the guiding principle for border management can provide assistance to better manage the growing volume of travellers flows through the "air" borders. The solution, which can provide customs with information about passengers in advance would enable customs to perform risk-based targeted controls on passengers and the goods carried by them while enabling the flights to be processed more effectively. The ability of border control agencies to identify persons of concern in advance of their arrival or departure is considered significant in supporting a government's commitment to ensuring the safety and security of its citizens.

The introduction of risk management techniques within Customs often comes as a result of the acknowledgment that due to an increasing cross-border flows and changing government priorities, the administration is unable to continue to deliver its customs control operations in the same manner as previously. Therefore, this generally means that administrations recognize that they can no longer interact physically with 100% of cross-border flows and need to move from traditional style controls towards a risk-based operating model by a reassessment of its mission, roles, and methods of operation. To address this challenge most administrations, implement risk-based selectivity and targeting.

The use of Advance Passenger Information (API) and/or Passenger Name Record (PNR) for risk assessment would greatly assist Azerbaijan Customs to meet the needs of enforcement and facilitation of legitimate travel and would be the starting point for the further development and exploitation of intelligence for controlling the travellers [2; 3].

Analysis of literature data. Over time, ACS has aligned its passenger control procedures with the best international practices in terms of duty-free baggage allowances and simplified procedures supported by modern infrastructure and other facilities. Aiming and adopting modernization, ACS has become more transparent in its activity in

terms of simplification of Customs procedures, recent reformation of customs legislative framework and continuous trade facilitation measures and the introduction of concepts recognized as international standards in the field of customs. ACS has taken steps to offer measures such as electronic data exchange, e-declaration, risk management, pre-arrival data exchange on goods, Single Window principle, etc. Many of these measures have been introduced to the public as e-services available through the customs and state e-services web portals. A significant part of the measures undertaken was devoted to enhance facilitation and simplification of Customs formalities in border crossing [4].

Currently, many border control agencies all over the world prefer more selective approach for passenger control which is based on intelligence data analysis, behavioural patterns, risk management, and other efficient methods of targeting, also combining these approaches with the traditional random selection methods. It is widely recognized that using such methods produces better results than routine systematic inspections [5].

Currently, ACS performs the border checks on passengers on the basis of the following techniques and methods: behavioural analysis, documents control and past experience when selecting passengers for further checks; the use of non-intrusive technical means of customs control such as X-ray equipment for baggage examinations; dual-channel system (Red and Green Channels) for speedy clearance of inbound baggage; basic pre-arrival screening of the "air passengers" based on the paper lists of passengers provided by some airlines in advance for certain flights (departure and arrival time of transport, the total number of passengers with an indication of names carried on that transport and initial point of embarkation); simplified e-declarations for passengers (declarations can be submitted electronically in advance by filling the web-based declaration form before arrival to Azerbaijan or by using the special electronic kiosks installed in the airports) [6].

The purpose of the research. The main goal of this article based on the experience of Azerbaijan customs service to provide guidance and support to the interested Customs Authorities to successfully implement their national API/PNR Programme in order to facilitate border control and clearance of passengers and their baggage using air transport, prevent smuggling and entrance of potentially high-risk goods and individuals into the country.

Materials and Methods of the Research. Continuous growth in the number of passengers on international flights increases customs authorities and other relevant agencies need to be prepared to handle the number of passenger without harming the speed of the passengers flow through the "air" border checkpoints. Responding to this increase, the use of modern technology and greater domestic and international cooperation can enhance the effectiveness of customs control and assist customs to more efficiently cope in preventing the cross-border movement of terrorists, threats arising out of the terrorist activity, prevent smuggling, drug trafficking and other dangers to national security. Incorporating passenger selection/screening criteria based on high-quality risk indicators and advanced passenger information has proven to have a positive effect on enforcement activities.

While the decisions taken by customs officers are based on their experience, expertise, and information at hand, it is difficult and mostly impossible to assess all the risks without all the information that could have been obtained through the pre-arrival data

on passengers. In addition, these procedures, particularly during the crowded touristic seasons, are often judged by the travellers as measures affecting their dignity (for example, while waiting for primary or secondary checks, while being held in holding rooms or short-term holding facilities, upon the refusal of entry or during searches). If the situation is not explained well to the passengers, routine checks based on unreasonable impressions of the customs officers may lead to perceived discrimination and other implications. In this regard, passenger targeting and risk management tools with the use of the Advance Passenger Information (API) and Passenger Name Record (PNR) datasets could be beneficial to Customs authorities to switch from the routine checks to a passenger selection/screening criterias based on high-quality risk indicators and analysis of pre-arrival information [7; 8].

The need for customs to enhance controls, related with the growth of air passenger traffic has started to place strain on the resources of ACS, resulting in possible delays in the processing of passengers arriving at airports. Taking this fact into account there is a growing need to find a solution that would assist customs to handle increasing workloads.

This demand of customs could be solved with investing in a solution that would tailor customs processes while adhering to international standards. Providing the ACS with passenger information in advance of a flight arriving in Azerbaijan will facilitate checks against watchlists to identify persons of interest before passengers arrive at border control. This will be to the benefit of both the State and genuine passengers by:

- Assisting in the prevention of crime;
- Facilitating the smooth passage of legitimate travelers;
- Allowing for improved and more effective management of the State's borders.

In order to accurately balance between facilitating cross-border movements and upholding border security, effective cooperation between government bodies, the transport sector and relevant international actors is essential. At the moment API and PNR are two technical solutions to streamline traveller identification management and facilitate border management.

The importance of a legislative framework for API/PNR data transfer is stipulated in Revised Kyoto Convention [9].

API involves the capture of a passenger's biographic data and other flight details by the transport operator before departure and the transmission of the details by electronic means to the Border Control Agencies in the destination country and made available on the primary line at the border crossing point. API enables national border agencies and other government departments to pre-identify persons of interest prior to their arrival (Table 1).

PNR data (Table 2) are unverified information provided by passengers and collected by air carriers to enable the reservation and check-in processes. It includes information on travel itinerary, ticket information, contact details, means of payment and others. PNR differs from API comprising a greater number of data sets. The analysis of PNR data can provide the authorities with important elements from a criminal intelligence point of view, allowing them to detect suspicious travel patterns and identify forms of serious crime, associated criminals and terrorists, in particular those previously unknown to law enforcement [10].

Table 1

Advance Passenger Information (API) Data Items

№	Data Item	Definition
1	Travel Document Type	Type of Travel Document being used.
2	Travel Document Number	Identification Number of the Travel Document
3	Travel Document Expiry Date	Expiry date of the Travel Document. Mandatory only if the travel document has one.
4	Travel Document Issuing State	State/Organization that issued the Travel Document being used
5	Surname	Surname (family name) of the travelling person
6	Given Names	Given names of the travelling person.
7	Gender	Gender of the travelling person
8	Date of Birth	Date of birth of the travelling person
9	Nationality	Nationality of the travelling person
10	PNR locator code	A code which uniquely identifies a particular PNR record for a given voyage. This code is used to link a passenger's API data to a single PNR record. The same PNR record locator code needs to be included in both the API and PNR. It is anticipated that Carriers use the booking reference or PNR to populate this data element.
11	Carrier Operator Unique Passenger Reference Identifier	Used to uniquely identify a passenger within a Carrier's Reservation and Departure Control System's (DCS). Therefore there is no repeat between flights.
12	Initial Point of Embarkation	Port code of the initial place of embarkation
13	Final Point of Debarkation	Port code of the final place of debarkation
14	Transit Flag	Indicates if the passenger or crew is in transit
15	Total Luggage Weight	Weight of total luggage carried by a passenger
16	No of Bags	Total number of bags carried by a passenger
17	Bag Tags	Tag information of bags carried by a passenger
18	Security Number	Unique number allocated by the check-in desks and it identifies a passenger.
19	Baggage Details	Details of the baggage including bag destination
20	Seat number	Passenger seat number

Table 2

Passenger Name Record (PNR) Data Items

№	Data Item	Definition
1	2	3
1	Passenger Name Record (PNR) locator code	A code which uniquely identifies a particular PNR record for a given voyage. This code is used to link a passenger's API data to a single PNR record.
2	Date of reservation / issue of ticket	Date reservation made.
3	Date(s) of intended travel	Date Passenger intends to travel.
4	Name(s) on the PNR	Passenger name.
5	Available frequent-flyer information (free tickets, upgrades, etc)	Card number and type of any frequent flyer or similar scheme used.
6	Other names on PNR, including numbers of travellers on the PNR	Including names of all other passengers on the booking and any contact person.

Table 2 (ending)

1	2	3
7	All available contact information (including originator information)	Passenger's address and any further contact address for the passenger/reservation. Can include telephone number for Passenger, Travel Agency, Hotel etc. Email address of person who made reservation.
8	All forms of payment information and billing information	Specifies payment means and details (e.g. Credit Card Number).
9	Travel itinerary for specific PNR	PNR flight itinerary segments/ports, itinerary history, origin city/board point, destination city, active itinerary segments, canceled segments, layover days, flown segments, flight information, flight departure date, board point, arrival port, open segments, alternate routing unknown (ARNK) segments, non-air segments, inbound flight connection details, on-carriage information, confirmation status
10	Travel agency and Travel agent	Travel agency details, name, address, contact details, IATA code
11	Code share PNR information	PNR reference of code share booking.
12	Split / Divided PNR information	The fact that a reservation in respect of more than one passenger has been divided due to a change in itinerary for one or more but not all of the passengers.
13	Travel status of passenger (including confirmations and check-in status)	Travel status of passenger, including confirmations, check-in status, no show or go show information
14	Ticketing information including Ticket number, one-way tickets, and Automated Ticket fare quotes	Includes ticket number and ticket type.
15	All baggage information	Number of bags, total weight, tag numbers, destination of bags and pooled bag details.
16	Seat information include seat number	Class of travel, seat number and cabin number request where applicable.
17	General remarks including other supplementary information (OSI) and Special Service Information	Other supplementary information, e.g. Infant, Staff, VIP. Special Service Information or Special Service Requests.
18	Any collected Advance Passenger Information (API)	Any API data elements collected at the time of booking. Name and travel document number will be extracted.
19	All historical changes to the PNR listed in data types 1 to 18 above	All changes to the PNR record.

The scope of API and PNR data refers to data about travellers collected prior to departure or at the time that flight bookings are made. The API/PNR data comprises personal, financial information (travellers identifying details, method of payment and bank details, contact details, routing and etc.) about travellers which requires

adequate protection against misuse. Reviewing the work done so far in the described area, in order to create efficiently working system the following approaches could be implemented (Figure 1).

API/PNR data are key sources of information in order to carry out and rationalize customs controls on passenger's traffic in a more effective way. By using PNR data in real time, pro-actively and re-actively customs authorities can assess risks and better combat serious transnational crime and terrorism threats.

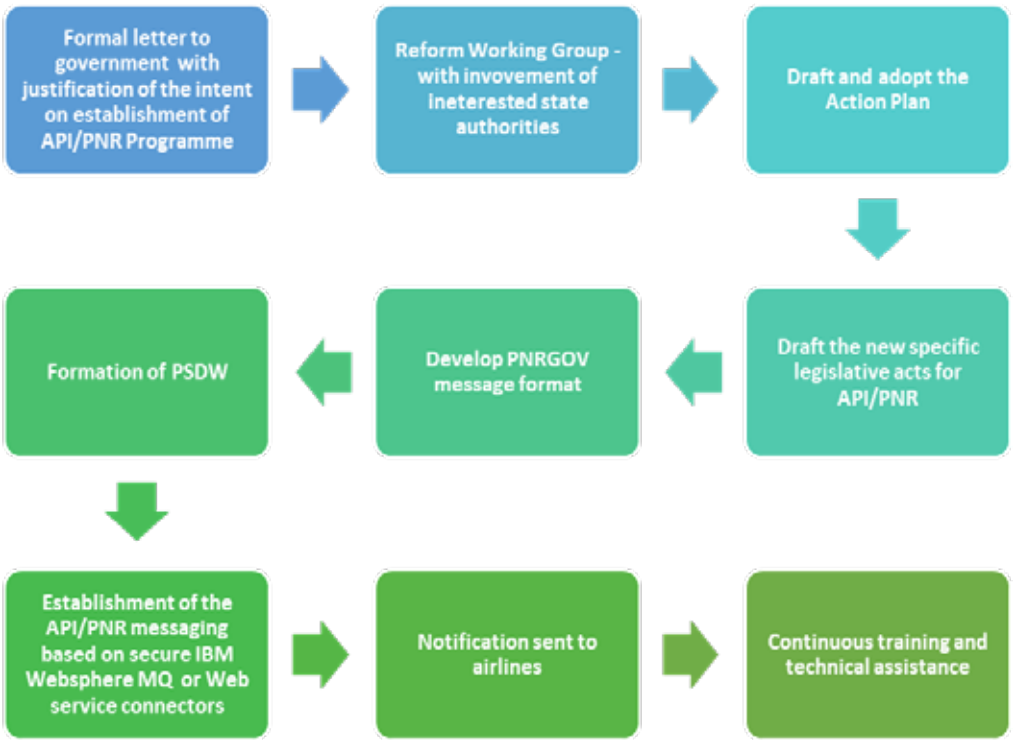

Fig. 1. Conceptual model of API/PNR system (PSDW – Passenger Data Single Window)

In order to perform their tasks as efficient as possible, ACS, for example, is recommended to use a combination of traditional techniques of customs control such as behaviour analysis and questioning with the modern non-intrusive control technique through the use of API/PNR data processing.

Pre-arrival risk assessment is applied at three levels: selection of flights for risk assessment coverage; profiles and criteria searches that run over a selected flight to identify passengers for further analysis; and analysis of passenger information and intelligence which may highlight a passenger as a person of interest (including national watchlists).

Flight and passenger selection decisions should be based on risk indicators and profiles which are developed by using historical data. The procedure allows travellers information to be processed against other information available in the national databases

including intelligence information from the law-enforcement and other government agencies. The end result is an improved process or system that assists border agencies in identifying individuals who require additional inspection and making informed decision on the admissibility of individuals seeking admission into the country. With respect to the Azerbaijan Customs Service, the properly deployed API/PNR risk analysis system will enhance the performance of Azerbaijan customs in combating the trafficking of drugs, weapons, counterfeits and cultural goods (for example to be able to measure the frequency of goods conveyed by passengers, by combining the data with the national passenger declaration database). As the information on passengers will be available prior to a flight, it will be possible to ensure large-scale and very rapid identification of sensitive or illogical routes, inconsistencies of unduly short duration of stay with weight/size of a passenger's luggage, unusual forms of payment, past criminal patterns etc., or a combination of these criteria.

API and PNR data play an important role in identifying the risks associated with the baggage of passengers because it allows customs authorities to carry out targeted and risk-based control, which helps to detect and prevent a number of serious transnational offenses and organized crime while maintaining data protection and privacy. Specifically, for Azerbaijan, targeted controls based on API/PNR analysis can support customs in combatting with the illegal outbound movement of the currency, cultural heritage and goods prohibited and restricted for importation. The use of API/PNR data, which enables identification of passenger based on their risk profiles.

Conclusions. Pursuing a global approach with regard to the transfer and use of API/PNR data, this article brings together approaches and recommendations how to implement the national API/PNR Programme on the example of Azerbaijan.

Border control arrangements in Azerbaijan concerning travellers seek to maximise the economic, societal and political benefits of travel while at the same time identifying and mitigating risks and threats. To achieve these national objectives, Azerbaijan must identify travellers and assess traveller risks.

The benefits of API and PNR transmission will enable border control authorities of Azerbaijan to identify potentially high-risk individuals, prevent smuggling and process passengers in a rapid and efficient manner.

The development of modern and effective passenger targeting and risk management tools on the basis of API and PNR datasets is a clear example of effective use of human resources in customs. The solution increases the effectiveness of the checks with the usage of the same personnel.

Establishment of the system will also benefit the inter-agency cooperation, as the technology requires collaboration and interconnection of the databases with the State Border Service, Police, other governmental agencies, and airlines.

REFERENCES

1. Number of scheduled passengers boarded by the global airline industry from 2004 to 2022 (in millions). URL: https://www.statista.com/statistics/564717/airline-industry-passenger-traffic-globally.
2. Guidelines on API. URL: http://www.wcoomd.org/~/media/wco/public/global/pdf/topics/facilitation/instruments-and-tools/tools/api-guidelines-and-pnr-doc/apiguidelines_eng.pdf?db=web

3. Passenger Name Record (PNR) Guidelines. URL: https://www.iata.org/iata/passenger-data-toolkit/assets/doc_library/04-pnr/New%20Doc%209944%201st%20Edition%20PNR.pdf.
4. Customs Code of the Republic of Azerbaijan. URL: https://continent-online.com/Document/?doc_id=31145374.
5. Decree Cabinet of Ministers of the Republic of Azerbaijan № 263, 22.07.2014 "On declaration of commodities and transportation means passed through the customs border" – Article 17. URL: http://www.e-qanun.az/framework/28199.
6. The official website of the State Customs Committee of the Republic of Azerbaijan. URL: https://customs.gov.az.
7. Message Implementation Guides on API and PNR. URL: http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/tools/api-pnr.aspx.
8. WCO Recommendation concerning the use of API and PNR. URL: http://www.wcoomd.org/-/media/wco/public/global/pdf/about-us/legal-instruments/recommendations/facilitation/rec_2012_api_pnr_en.pdf?la=en.
9. Revised Kyoto Convention. URL: http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/conventions/pf_revised_kyoto_conv/kyoto_new/spanj.aspx.
10. Council of the European Union. Common non-paper on the value of PNR for Customs law enforcement and risk management in light of the new PNR Directive. URL: http://www.statewatch.org/news/2017/mar/eu-council-dutch-customs-pnr-paper-14785-16-rev3.pdf.