Analysis of traditional Global Distribution Systems vs. New Distribution Capability

Casandra Venera PIETREANU*

*Corresponding author
"POLITEHNICA" University of Bucharest, Aerospace Engineering Department,
Polizu Street 1-7, Sector 1, Bucharest, 011061, Romania,
casandra.pietreanu@yahoo.com

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Abstract: *The development of airline services distribution from computer reservation to global distribution systems experiences nowadays a novel transformation based on an improved approach and higher benefits for all actors involved in the distribution process. In the first years since launching the new distribution capability (NDC) developed by IATA represented a problem with many unknowns, especially for airlines, traditional distribution channels and travel agencies. In order to better understand the need and implications of NDC, the particularities of various distribution channels were analyzed to underline possible drawbacks of global distribution systems and the rationale for which they need to be improved or modified. Thus, comparative analysis of the two global leaders among distribution systems in Europe and America (i.e. Amadeus and Sabre) were performed. In this context, operative and economic processes governing the distribution system were considered in terms of analyzing the importance of distribution process developing. Different criteria for product commercialization like product complexity, price or information importance mirror airlines' competition for offering best experience to passengers. These aspects were studied from the perspective of the opportunities offered for shaping the future of the air distribution service. After the critical analysis of GDSs, the impact of NDC was evaluated considering the perspectives and approach of low cost or legacy carriers.*

Key Words: *IATA New Distribution Capability, Global Distribution System, airline services, impact, standard*

1. INTRODUCTION

The new standard in airline distribution capability has emerged as a threat to traditional global distribution systems. Further studies on the program showed a trend related to the airlines needs to enhance and customize their offerings, which does not exclude GDSs, but integrates them into an improved system. The current paper will be built on several directions; commencing by evaluating the characteristics of traditional global distribution systems with emphasis on the European alternative to the American (Saber) platform. Specific features of distribution channels, their market share and an evaluation of distribution systems according to different factors were considered in the critical analysis of GDSs.

The assessment of endogenous and exogenous factors performed for the GDSs/IT providers was accomplished with the help of aviation representatives from Romania

operating in different areas: airlines, airports, handling agents, travel agencies, etc. The participants in the study were asked to complete questionnaires utilized for developing the evaluation of Amadeus considering factors like adaptability, flexibility, staff qualification, etc. (table 4), its cooperation with the industry or reserch centres and universities in order to align with industry trends (table 5), but also the subjects' knowledge on NDC by year (see fig. 1).

Although the anonymity of the participants for the survey was kept for confidentiality reasons, it can be noted that the study implied 123 subjects, only professionals in the aeronautical industry, working for airlines (like Tarom, Blue Air, Ryanair or Wizz Air), airports (International Henri Coandă Airport, Băneasa, Iași, Cluj and Timișoara Airports), airline ticketing services, and ground handlers (mainly represented by Romanian Airport Services/Regional Air Support), or aeronautical authorities (Romanian Civil Aeronautical Authority) and travel agencies (for example Paravion Tour SRL Bucuresti, Pavel Travel SRL, eSky Search Travel SRL, and others).

The research considers important criteria for a modern development of distribution capabilities and the implications of the transition to NDC.

2. CRITICAL ANALYSIS OF TRADITIONAL GDSs

Global distribution platforms were founded by airline groups for their use and subsequently, were expanded to travel agencies. Over time, they have been improved, reorganized, acquired by other groups or have created alliances with other GDSs in order to take over a larger market share and to support the passenger's needs to purchase various services. Consequently, starting from a traditional model of connecting airlines to travel agents, GDSs have succeeded in covering both global and local content.

Due to the technological developments the optimal size of companies has increased [14] and this is a good aspect, since companies need to be big in order to compete [8] on the global distribution market. Definitely, Amadeus approach to develop a business differentiation strategy has involved taking into account aviation's competitive environment, but first and foremost, it has considered the passenger's sensitivity to quality. Another important aspect regards the price ratio, but in the case of this GDS, the following research will show that prices are kept in the upper limit.

Table 1 – Amadeus and Sabre GDSs characteristics (2017)

GDS	Amadeus	Sabre
Market share	44%	36.3%
Countries	195	100
Airlines	> 440	>400
Offices	>70	>60
Employees	15,000	N/A
Travel agencies	>90,000	>55,000
Hotels	100,000	88,000
Rent-a-car	30	40
Railway operators	103	50
World GDS leader prize	2006-2010, 2012-2016	2003-2005, 2011
Certifications	ISO:9001:2000	Nil

Source: based on data from Amadeus and Sabre GDSs

The comparative analysis of the two global leaders among the distribution systems (i.e. Amadeus and Sabre) (table 1), underscores the benefits of the first GDS, which will become the main pillar for the cross-examination that will be developed hereinafter. Thus, the author will assess the idea of precluding these distribution platforms since they have already reached such high performances. The two platforms have appropriate values in the regard of the exhibited criteria, although they do not share the same market segments. The Semi-Automatic Business-Related Environment (i.e. Sabre), developed as a global technology company in order to facilitate the reservations for American Airlines, is a leader in the American distribution sector; while Amadeus is the leading player in Europe. Onward, regarding the assessment of the impact of NDC program in Europe and more important, on the Romanian market, the report will further consider aspects related to the Amadeus GDS.

The main benefits of GDSs are considered to be the facility to penetrate new segments or markets and the development of passenger communication channels [10], having as basis operative and economic processes that condition the distribution system. In the case of Amadeus, the following table exhibits the degree of coverage of the distribution market.

Table 2 – Amadeus market share (2017)

Amadeus market coverage	Market share (%)
North America	18.2
West Europe	67.5
East Europe	71.3
Latin America	42.5
Middle East	37.8
Africa	61.3
Asia Pacific	33.0

Source: based on data from Amadeus GDS

Surely, the particularities of the distribution channel are in direct connection to economic development which is characterized by considerable use of technology, improved logistics and informed customers [11]. In global distribution channels, IT technologies control operations allow data processing and help increase channel types [16], [17], but can also improve the market share by covering more markets. If considering Amadeus in the last 14 years, it invested €4 billion in research, in order to develop improved information systems and processing technologies.

Networking technologies and data processing infrastructures are IT tools used in order to achieve an accurate, faster and comprehensive information sharing [17] among global distribution systems. The devices, software and IT infrastructure used by Amadeus are the basis for 3.8+ bln transactions and 3.9+ mln net bookings per day.

Table 3 – Amadeus processing technologies

Amadeus IT characteristics	Evaluation
Physical IT infrastructure devices	19,000+
IT infrastructure change per month	6,300+
Application software loads per month	600+
Maximum transactions per day	3.8+ bln
Maximum transactions per second	55,000+
Maximum net bookings per day	3.9+ mln

Source: based on data from Amadeus GDS

In 2016, Amadeus reported €3,417.7 million revenues and €1,306.0 million EBITDA [13], this numbers have grown from year to year with an average percent of 23.5 % (i.e. the incomes in 2016 reached €4,473 million). But the benefits (including materials) brought to the airlines initially by GDSs have been minimized. In recent years airlines have even pushed travelers to buy tickets directly from their websites, charging additional fees for services purchased through a global distribution system.

The following evaluations of endogenous and exogenous factors performed for the global distribution system and IT provider Amadeus was accomplished by the aviation representatives from Romania, operating in different areas.

Table 4 – Amadeus GDS evaluation according to endogenous factors

Critical factors	Evaluation of Amadeus GDS											Score limmits
	Very weak				Satisfying			Very good				
	- 5	-4	-3	-2	-1	0	1	2	3	4	5	
Prices						x						-3-3
Services										x		2-5
Staff qualification										x		0-5
Flexibility									x			0-4
Adaptability										x		2-4
Technologies used								x				1-4
Total	17											

Source: the author's work

The 123 participants to the study mentioned above, have been chosen among airlines, ticketing agents, travel agencies, airports assignees, departure control system staff, check-in agents, ground handlers, general sales agents, general services administration, etc. working directly with GDSs. They were suggested to perform the evaluation of the platform in question by comparison with other GDSs (if possible).

It was considered the average score for each endogenous factor examined by the respondents and it was marked by "x" in the areas of the table as follows: Very week (-5, -2), Satisfying (-1, 1) and Very good (2,5). The minimum number of points allocated for all the criticial factors analyzed (prices, services, staff qualification, flexibility, adaptability and technologies used), was 10, while the highest score was 24.

The quality of services is the key factor for gaining competitive advantage [1], more so considering the number of global distribution systems on the market. Consequently, while the average score was 4 in the case of the services offered to third parties, the manner in which the GDS qualifies its personell or its adaptability to changes in the aeronautical field and 3 for the company's flexibility; lower scores (2) were offered for IT support used to meet the new challenges in distribution capabilities and 0 for the prices applied for their services.

The strategy of price setting is a key factor in revenue integrity [19]; from this point of view, the analyzed GDS was placed by its business partners in a satisfying area, being considered to have high prices. Since this criteria was severly judged by the subjects, this

analysis shows that the industry can be considered satisfyed with the services offered by Amadeus, but considers itself opened to improved distribution platforms, which also involves minimizing costs for the industry.

The subsequent inquiry was performed by specialists in the industry, other GDSs, profile universities and research institutes and reveals new aspects of the GDS, developed from external factors.

Table 5 – Amadeus GDS evaluation according to endogenous factors

Critical factors	Evaluation of Amadeus GDS											Score limits
	Very weak				Satisfying			Very good				
	- 5	-4	-3	-2	-1	0	1	2	3	4	5	
Market share											x	4-5
Company immage										x		3-5
Knowledge on NDC							x					-1-2
Cooperation with the industry										x		3-5
Cooperation with universities										x		2-5
Total	18											

Source: the author's work

The outcomes marked between 9-25 for all factors, reflect satisfying or good results noted with 4 points for the company immage (with score limits of 3 to 5) and cooperation with the aviation industry and universities (lower and upper score limits ranging between 3 and 5 and 2 and 5, respectively). In respect to the market segments, the score was predictable, but in the case of the awareness regarding IATA's new standard, the results do not meet the expectations.

In the light of the points outlined above, the question is how and why did the need of implementing a new distribution capability arose? The background for launching the NDC program was mainly related to the airlines needs to customize their offerings. Moreover, the options airlines begun to offer through their websites could not be effectively duplicated in the GDSs due to technology limitations, such as dissimilarities in data formats [2], [6].

3. QUANTIFICATION OF THE IMPACT OF NEW DISTRIBUTION CAPABILITY

Between years 2000 and 2007, GDS booking has reduced to 16%; thus, at that time, the need to remove global distribution systems could have been considered, but the following years brought a slightly improvement in GDS booking [10], therefore it seemed more appropriate to rethink the system and improve the business model.

Global distribution system technology is improving slowly; this can be illustrated by the fact that the access to the content of GDSs is hardly accessible through an API or even via an agent terminal [12]. Thus, as GDSs do not have the technology to properly display airlines content, as airlines would like, they do not provide full access to all airline products, especially to ancillary services [12]. It seems that the decision of not using GDS

distribution any longer represents an approach or a symbolic characteristic of low cost carriers [10], hence, at this time, for GDSs, making profit is a matter outranked by compliance with the norms of the new standard, that its own services are accepted in different markets.

Choosing a distribution channel to the detriment of another was initially considered/ thought to be influenced by the level of involvement of distribution systems, which provided a variety of services [3]. Considering the number of airlines, the Regulation (EC) (2016) [15] shows that Amadeus global distribution system market share was 15% and by the passengers boarded, 35% in 2015 on an average, while for Navitaire, considering the same criteria, the percentage was 7.5% and 15%, respectively; for the Amadeus Navitaire IT supplier instead, the market share index grew significantly to 25% and 55%.

From more than ten years ago, global distribution systems considered the threat of concentrated sales on direct bookings from online channels. The manner used to address this issue was by developing the proper infrastructure for internet portals [18].

A study developed by IATA and a research contributor (i.e. ARG) provides insights into distribution trends in aviation. Three years from now (i.e. by 2021), the distribution channels that will be mainly used are the websites of airlines, whose share will be 37% (4 percent more than in 2016), an important growth of 5% will correspond to product sale through mobile apps, but a decrease of 4% will be represented by airline tickets and ancillary services sold by agencies [9].

Experts rushed to affirm that these changes in the aeronautical field will suppress or even eliminate the GDS activity by 2020. Instead, it seems that GDSs will have to look for new business models in order to remain on the market, because the hotel and car rental industry will continue to benefit from GDSs. They will have to adapt the products and services to social changes, given for example by the existence of price comparison sites which annuls the need for GDSs. It is thus a question of transforming a threat into an opportunity. For all parties, the transition to NDC will imply adapting their services and becoming a part of the program, which means adopting NDC-XML and becoming certified. For example, IT providers have been accorded 'NDC Capable' Level 3-the highest level certification- by IATA for their Passenger Service System [5], [7], which covers offer and order management. This is the case of 22 IT suppliers such as Amadeus Navitaire, Sabre, SITA, IBS Software, atAirlines Technology, Datalex, Travelport, Travelsky and others. The majority (63%) have Level 3 certification, 42% of this IT service providers are established in Europe, 26% in USA, 11% in Asia, 11% in India, and the rest: 5% in South America and the last 5% in Middle East [4].

A comprehensive assessment of the new distribution capability impact in the industry, must address airlines, ticketing services, travel agencies and billing and settlement plan coordination services. The author's research revealed that airlines were the top critics in the matter of evaluating GDSs characteristics, indicating their yearning in exploring novel opportunities for improved technology solutions and transaction processing.

The awareness of the NDC program among aviation professionals in Romania shows the following figures considering a large period (from the moment the program was launched-in 2012, until 2018-the year the study was performed). The graph only indicates if aviation representatives have knowledge about IATA's NDC standard, but that doesn't mean that the subjects of the study fully understand the importance, influence or implications of NDC. Nevertheless, an improvement in the interest for NDC of the actors directly involved in the distribution system (including departure control system employees, general services administration or BSP coordination/ABCS Consolidators), is shown in the last 4 years.

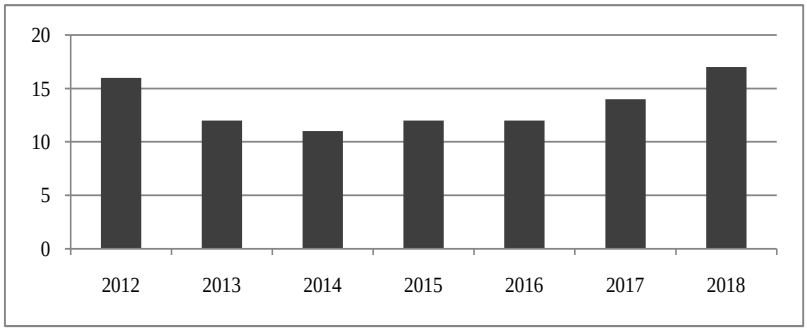

Fig. 1 – Number of subjects by year they learned about NDC

Source: the author's work

On the other hand, the impact on national travel agencies can be studied from the perspective of the 2639 agencies operating in our country at the beginning of 2018. The licensed travel agencies in Romania are analyzed in the following table:

Table 6 - Characteristics of Romanian licensed travel agencies (2017)

	Area/County	No. of agencies	Percent		Area/County	No. of agencies	Percent
1	Alba	37	1.40%	22	Hunedoara	36	1.36%
2	Arad	34	1.28%	23	Ialomiţa	14	0.53%
3	Argeş	69	2.61%	24	Iaşi	87	3.29%
4	Bacău	59	2.23%	25	Ilfov	50	1.89%
5	Bihor	61	2.31%	26	Maramureş	35	1.32%
6	Bistriţa-Năsăud	27	1.02%	27	Mehedinţi	12	0.45%
7	Botoşani	14	0.05%	28	Mureş	58	2.19%
8	Brăila	41	1.55%	29	Neamţ	42	1.59%
9	Braşov	118	4.47%	30	Olt	17	0.64%
10	Buzău	31	1.74%	31	Oradea	1	0.03%
11	Călăraşi	17	0.64%	32	Prahova	94	3.56%
12	Caraş-Severin	19	0.71%	33	Sălaj	11	0.45%
13	Cluj	141	5.34%	34	SatuMare	19	0.71%
14	Constanţa	135	5.11%	35	Sibiu	75	2.84%
15	Covasna	12	0.45%	36	Suceava	53	2.00%
16	Dâmboviţa	22	0.83%	37	Teleorman	8	0.30%
17	Dolj	40	0.15%	38	Timiş	95	3.59%
18	Galaţi	60	2.27%	39	Tulcea	19	0.71%
19	Giugiu	7	0.26%	40	Vâlcea	29	1.09%
20	Gorj	17	0.64%	41	Vaslui	18	0.68%
21	Harghita	19	0.71%	42	Vrancea	32	1.21%

Source: based on data from the Ministry of Tourism

The table does not consider the highest number of agencies in Romania (854) that have their headquarters in Bucharest, which represent a major development pole for the ancillary services offered by airlines.

The pro's for choosing the services offered by travel agencies mainly imply client counseling as respects to a full package that can be bought by a passenger (consisting of the basic service – airline ticket, which can be completed by ancillary services).

The initial concerns of GDSs that the new distribution capability will assume their vanish, would have also been reflected in a reduction in the services provided by travel agencies. This could have represented a turning point for the approximately 3000 travel agencies in Romania, which would experience a series of important changes.

However, travel agencies, as primary clients of GDSs, must adapt to this new capability, as they did to other chain changes regarding the modifications in fixed commissions offered by airlines. The expertise of travel agencies on e-commerce and airlines' dedicated services must be harnessed, just as traditional distribution systems should be framed by IATA's current distribution standard. Thus, aviation service providers must show flexibility and comprehensibility for continuous developing and achievement of high performance [20] in integrating the NDC platform in their business model.

4. CONCLUSIONS

The paper aimed at outlining the particularities and performances of distribution channels, analysing specific features such as market coverage or business differentiation strategies, but also networking technologies and data processing infrastructures. The study was limited nationwide to aviation representatives that evaluated the need for personalized air travel offers provided by various distribution platforms. However, the research tool takes into account the opening of the program analyzed (NDC) for the international market.

By the instrumentality of in depth analysis of the opinions and requirements of the entities working directly with GDSs and by means of questionnaires, the research outlined new business opportunities but also the risks induced by the distribution standard imposed by IATA.

The new distribution capability implies improved information systems which align to the trend of using different gadgets or laptops by younger persons for purchasing airline tickets and ancillary services. This situation is in contrast to the preferences of older passengers who choose to purchase these products directly from the airport or from travel agencies.

The study has outlined the perspectives of aviation service providers willing to adapt to modern distribution capabilities and to develop business models and services in trend with social and technological changes.

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