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New Distribution Capability (NDC) and its Effects on Travel Industry in Oman

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Abstract

Purpose: The objectives of the study were to analyze the effects of transformation from GDS to NDC from the perspectives of the travel agencies in Oman; to find out the concerns of the travel agencies in Oman with regards to the implementation of NDC and to compare the benefits of NDC content with GDS from the perspectives of the travel agencies in Oman.

Design/methodology/approach: A questionnaire survey, telephone, and personal interview were conducted with 19 top leading travel agencies in Muscat region, Oman. Each Travel agency manager was given the questionnaire through online. The telephone/ personal interview was also conducted. Around 78 employees were targeted out of which only 13 responded. The data collected was analyzed using Statistical package.

Findings: The findings support the fact that Oman being a small market with many small and medium players' implementations of NDC is slow. The current pandemic has slowed it down even further. But the travel agencies should be offered help in terms of training and awareness by the NDC platform and some major airlines to speed up the adaptation. The study showed that the high cost of technological implementation is going to be one of the major barriers to complete switch to NDC system. As of now, the travel agents will be settling for GDS with NDC.

Research implications: The adaptation by NDC has been slow especially by airlines. With IATA pushing the implementation, major airlines are slowly but surely adapting it as they can see the benefits they can derive. The customers too are benefiting from direct buying. The travel agencies in Oman especially small and medium-sized travel agencies are the ones who are most affected and there is not enough research being done to find what is it that is stopping them from adapting.

Practical implications: The pandemic has devastated the travel industry overall. Many small and medium businesses have been forced to shut due to lockdowns. Further, the customers have got used to online shopping at discounted and competitive price. Under such scenario it will take the travel agents some time to start enjoying the same levels of profit margins as the pre pandemic days. This will have an impact on unemployment as well as the inability to meet loan commitments. This can have a ripple effect.

Originality / Value: Few academic research has been carried out on NDC, especially in the Middle East. This research is the first of its kind which is dedicated to travel agents from Oman. The fact that NDC is set to revolutionize the shopping experience for the consumer one cannot ignore the fact that it is set to blow a dent in the revenues of the Travel agents.

Keywords: New Distribution Capability (NDC), GDS, Travel Agencies in Oman, Adaptation of NDC, Cost & Revenue Management, Air travel.

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Introduction

Until the mid-1980s, travel agencies were using Computer Reservation System (CRS) as a traditional way of communicating travel information. In the late 1980s, CRS paved the way for the Global Distribution System (GDS) which provided a speedy, efficient, and secure means of access to travel and tourism information and booking via the internet or a direct connection. GDS typically allows users to book hotel rooms and rental cars as well as airline tickets. They also provide access to railway reservations in some markets although these are not always integrated with the main system.

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GDS to New Distribution Capability (NDC)

From manual inserting of cards in the 1950s to a CRS, automation till the early 1980s the airline reservation has undergone many changes. CRS is a computerized system used to store and retrieve information and conduct transactions related to air travel. Originally designed and operated by airlines, it was later extended for the use of travel agencies. As CRS favored the airlines that owned them, by 1984 it paved the way for GDS. Major CRS operations that book and sell tickets for multiple airlines are known as GDS.

GDS is a computerized reservation network used as a single point of access for reserving airline seats, hotel rooms, car rentals, and other travel-related items by travel agents. GDS is the name for a computer (computerized) travel and tourism reservation system operating worldwide. GDS provides a speedy, efficient, and secure means of access to travel and tourism information and booking via the Internet or a direct connection. GDS powered more than US$268 billion in worldwide travel revenue in 2008 (Elliot, 2010). More than one billion transactions are carried out annually using GDSs, and it is estimated that nearly 500,000 travel agencies globally use a GDS to conduct business every day (CAPA, 2010). Modern GDS typically allows users to book hotel rooms and rental cars as well as airline tickets. They also provide access to railway reservations in some markets although these are not always integrated with the main system.

Initially, intending to reduce the cost incurred from GDS, the airlines wanted to bypass GDS, and the airline wanted to have more data of customers and will be able to sell more products than a GDS can sell. With this, there was even thinking that GDS would be redundant in near future. The reports of the death of GDS have been greatly exaggerated. Several industry analysts believed that GDS would not last long and that airlines would eventually shy away from them (Schaal, 2019). However, the expansion of technologies and the realization of how valuable consumer data has given new life to GDS.

For a long time, the airlines felt that their costs of commercial and distributions were high. 2020 was the worst year for the air travel industry post-COVID-19 as there was a drop in the revenues by half a trillion dollars (the revenue during 2020 was $328 billion whereas during the revenue was $838 billion) (IATA, 2020). In contrast, the cost is expected to rise by $61 billion. Thus, the loss per passenger will be reduced from $66 in 2020 to $13.78 for each passenger carried.

Also with the advent of digital technology they had to provide the best package to the digital customer in order to the escape commodity trap. The growing number of low-cost operators outside GDS who were selling their ancillary products and services signalled that the dependence on GDS was not necessary for full-cost carriers. The three major GDS systems viz. Amadeus, Sabre, and Travelport, dominated the airline distribution landscape for a long time. But all of this changed with the introduction of New Distribution Capability (NDC) by Direct Connect and International Air Transport Association (IATA) (Bingemer, 2018).

The current airline reservation and distribution scenario are as follows:

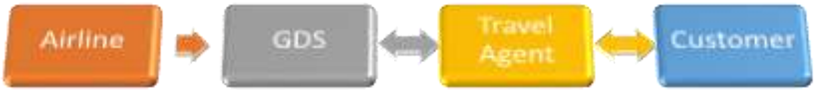

Figure 1 Airline Reservation and Distribution before NDC

To simplify the airline ticketing process IATA coined the idea of the New Distribution Capability (NDC) in the year 2012. NDC was introduced to bypass the GDS to reduce airline costs and to enhance airline products and services distribution and be less dependent on intermediaries. NDC was launched by IATA for enhancing the communications between airlines and travel agents. It can be used by any third party, an intermediary, IT provider. It can also be used by a non-IATA member.

Since the early 2000s, airlines have been looking for different means to put up their web media resources that might allow them to sell ancillary services. This would give them a platform to provide personalized services thereby differentiating themselves from their competitors (Eisner, 2019). This was not possible with GDS as it used the electronic data interchange for administration, commerce, and transport (EDIFACT) protocol. Also under the GDS, the airlines had to update price changes on a third-party system. Thus the loss of revenue due to suppression of sale of ancillary products as well as lack of control led to the introduction of NDC by IATA.

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NDC enables the travel agencies to convert their products sold by addressing current distribution limitations using different methods and distribution software: product differentiation and time-to-market, access to full and rich air content, and transparent shopping experience. Some key features of NDC include:

- NDC offer/order retailing support to airlines
- Make airlines competent enough to distribute catalog-style subsidiary services
- Facilitate through seat selling through seat maps and the related ancillaries services
- Facilitate the customer/seller to view through simulation the change in order if any, before confirming
- Facilitate to support regulatory requirements – the facility for the airline to indicate the refundable taxes etc.
- To facilitate improved customer experience.

According to IATA (2017), the initial NDC product developed in the first phase was concerned in three areas, viz.

1. ***Better traveler experience***

The traveler has the freedom to choose any services offered by the airline and if the passenger opts out of the service offered in the flight, for example, food, he will be rewarded with some additional benefits like extra points through frequent flyer programs, and the ability to reduce/save cost to provide a cost-efficient flight.

2. ***Better cost/revenue management***

The airline can manage its cost and enhance the revenue by giving direct connection to passengers for any requirement of ancillary services like food preferences or similar other services rather than depending on the GDS and paying money to the GDS provider.

3. ***Better decision-making data***

Airlines aim at having a rich and user-friendly interface and data so that communication and decision-making are seamless and cost-effective.

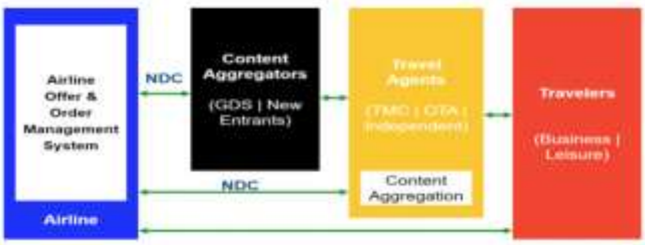

Figure No.2 Airline Reservation and Distribution with NDC
Source: (IATA, 2019a)

From 2012 until now, there have been multiple revisions to NDC technical communication standards by IATA. Its acceptability can be understood from the fact that 14% of airlines committed to being part of the NDC leader board pledging to deliver 20% of their indirect booking through NDC by 2020 (Kaplan, 2019).

GDS Participation in NDC

GDS providers have been showing great swiftness in certifying themselves in different levels of NDC certifications as they believe they can act as an intermediary in NDC implementation as an aggregator, IT platform, or IT provider. Also, GDS companies are aware that every airline will not move completely to NDC and some may move very slowly, so the GDS has still a great role to play in the future. To give an example Amadeus proudly claims that they will aggregate their content within the travel platform including NDC and make it simpler for buyers. They feel that NDC is only a part of a greater digitalization the entire travel industry is gearing up for. Sabre Corporation has also achieved level 4 certification as a part of their 'Beyond NDC' initiative. By doing so it is upgrading its capabilities for travel intermediaries

Travelport was the first GDS in obtaining level 3 compliance, which provides NDC services as an aggregator. Its first NDC product was introduced in 2017 through a roadmap, and the product was meant for airline companies. Subsequently it will be integrated in 2019 with online travel agents (OTAs).

Thus, it is evident that NDC will come, but via GDS. As more and more airlines are adopting NDC to their benefit, it now remains to be seen if GDS NDC aggregators will allow the airlines to have direct access to customers. But here again, it is the uncertainty in the mind of the travel providers and their willingness to wait and watch that is going to create a gap in the market.

As per the IATA website, the registration for NDC status of different service providers word wide as of March 2021 was as under:

Table 1 NDC Status of Different Service Providers

Business	Certification Status	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	NDC at Scale	Total
Aggregator		**1**	**3**	**14**	**26**		**44**
	Expired	1	3	3	2		
	NDC Certified			11	24		
Airline		**4**	**4**	**26**	**47**	**17**	**98**
	Expired	4	3	12	1		
	NDC Certified		1	14	46		
	NDC@Scale					17	
IT Provider		**1**	**1**	**26**	**40**		**68**
	Expired	1		13	3		
	NDC Capable		1	13	37		
Seller		**1**	**2**	**17**	**12**		**32**
	Expired	1	1	3			
	NDC Certified		1	14	12		
Grand Total		**7**	**10**	**83**	**125**	**17**	**242**

Source: (IATA, 2019b)

Impediments to Implementation of NDC by Travel Agents

In a study conducted by IATA in 2015, some areas were identified where help would be required to be given to travel agents. The report made recommendations on who is responsible to support the travel agencies. With regards to concerns of reduction in compensation for the travel agents, IATA believed that competition and legality will iron out the concerns. Any concerns they felt should be addressed by the Airlines. Regarding educating and communicating the latest updates with NDC educating IATA wanted all beneficiaries and NDC providers to support and work together.

NDC Implementation in the Region

Though implementation of NDC has been slow in the Middle East, the scenario is changing and Oman Air, the national carrier of the Sultanate of Oman, has become the first one from Oman to register with the NDC registry (Oman Aviation Services, 2019). Oman Air has achieved the level 4 certification of NDC which included the adoption of additional servicing messages to support re-shopping and changing orders (Oman Air, 2019).

Problem Statement

As per vilches (2018), there has been a 0.9% decline annually in the average airfare during the past decade. Added to that the Middle East landscape market was also projecting a change in consumer habits. According to him the direct purchase from the supplier has changed from 16% (in 2016) to 24% (in 2021), while OTA had increased from 12% to 17%. The offline purchase was set to decrease from 71% to 59%.

Though technology saves cost it also needs huge investments as well as lots of time which is a major deterrent. Oman's travel Industry is small and still growing compared to its neighbor the United Arab Emirates. Additionally, implementation of NDC comes with its baggage of cost and time. The timeline of airlines adopting NDC is different and the transition to NDC will take a long time, which means there can be

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no complete switch over from GDS to NDC. The other part of the problem is to get the different players i.e. travel agents, GDS providers, and airlines to pay for the infrastructure to implement NDC (Karam, 2019).

Further, there is also the fear of reduction of compensation. Lack of awareness and insufficient communication adds to the wait and watch approach in the adaptation of NDC worldwide including Oman. Travel Agents will be varying of any additional investment that will eat away the already dwindling profits especially post-pandemic. Considering all the above there is a dire need for the study which has given rise to the following questions:

Research Questions

The research questions that came up through the study were:

- What are the effects of transformation from GDS to NDC from the perspectives of the travel agencies in Oman?
- What are the concerns of the travel agencies in Oman with regards to the implementation of NDC?
- What are the benefits of NDC in comparison with GDS from the perspectives of the travel agencies in Oman?

Research Objectives

The research deals with the travel agent's response and adaptation to NDC. Accordingly, the objectives of the study were:

- To analyze the effects of transformation from GDS to NDC from the perspectives of the travel agencies in Oman
- To find out the concerns of the travel agencies in Oman with regards to the implementation of NDC
- To compare the benefits of NDC content with GDS from the perspectives of the travel agencies in Oman.

Review of Literature

GDSs needed to offer additional services to remain competitive due to the technological advancements to consumer trends that made GDS capture a decreasing share of the travel distribution market (Waksberg, 1997). Though the advancement of innovation in information technology influences the tourism industry, ease of use and awareness were the factors influencing the behavioral intention to use GDS in the industry (Budiasa et al., 2017). However, some of the individual airlines and hotel chains are trying to sell their products directly to their customers by overlooking GDS (Pan, 2015). Airlines felt that the dependence on GDS was not necessary for full-cost carriers (Bingemer, 2018). The two key factors which were behind the creation of NDC, namely Rich content and GDS-centric distribution as the existing system is complex (Eisner (2019). Also one of the biggest complaints against GDS by airlines has been that GDSs have stifled ancillary sales. They felt that though 200 of the ancillary products were of programing standards, GDS has failed to invest to create an infrastructure and to train its agents to profit from the ancillary sales (O'Neil, 2013). The epitome of the NDC concept is to place the airlines in a better position in an collaborative offer-making system (Jäckel & Maier, 2016).

Though there is a concern that GDS will perish, this is highly unlikely as the hotels and car rentals industry still would depend on the GDS system (Pietreanu, 2019). However, it is not the end of GDS because NDC is a direct connect, and there will still be a need for an aggregator of some description as individually it is not feasible to check all the airlines for quotes and availability (Salter, 2019). GDS providers do not want to lose relevance and have adopted the roles of aggregators (Decision Point, 2016). They are working on building an NDC solution into their existing technology but the predominant problem with the implementation, post-COVID will be diminished resources (BCD Travel, 2021). However, it is anticipated that the security, speed, reliability, and accuracy offered by GDS will make it grow with an expected Capital Annual Growth Rate (CAGR) of 5.5% from 2019 to 2027 (Transparency Market Research, 2019).

It is expected that most of the airlines to migrate to NDC simply to reduce their cost of distribution caused by the heavy fees charged by GDS. Those airlines who have adopted NDC will have more control over the travel agents' commissions and may not feel the need to pay it during the peak seasons (Salter, 2019). Despite introducing NDC based system, many airlines will continue to use the GDS system and website, along with NDC (Nabais et al., 2017). As not all airlines adopting NDC, the travel management companies need to integrate the NDC, non-NDC, traditional GDC content and the other modes of transportation like the car, railways for the customers make it more complex (BCD Travel, 2021).

Harteveldt (2015) reported that more than half of the prevailing travel agencies were not aware of and have not heard about NDC. The main weakness of the NDC system is the need for the system to adjust with the

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player that needs costly investment and there is a fear of biases in the pricing of business and private customers (Ziegler et al., 2017). Another problem with NDC is regulation around information sharing, transparency, competitive fairness. Further, GDS supports its agents by giving technology-free whereas IATA is not clear on who will bear the cost of technology and training for NDC (O'Neil, 2013). There is a clear lack and resistance in this transformation (Arslaninan, 2018). Due to the COVID pandemic, projects like NDC will be less susceptible to cutbacks and so the travel industry will embrace NDC and the airline distribution will evolve into a more active distribution i.e. a more flexible, dynamic, and passenger-centric environment by 2021 (Harteveldt, 2015). With the increasing demands from customers and the social media boom, NDC was seen as a win-win situation for the airlines as well as the customers (Salmi, 2015).

Research Methodology

Keeping the post COVID scenario in mind where most of the TMCs were forced to operate it was decided to target only the top travel companies in Oman, two GDS players, one Tech platform provider, and one airline using a quantitative approach. It was studiously decided to concentrate only on people with IATA accredited within the Muscat region. A questionnaire survey, telephone/personal interview was conducted with 13 leading travel agencies from Muscat, Oman. Each manager of the travel agency was given the questionnaire and the answers were confirmed subsequently through telephonic conversation after they filled the questionnaire survey. However, interviews were also conducted.

Many of the travel agencies in Oman were undergoing cost cuts due to the loss of business under the pandemic. Hence the response to the research was not also affected. Around 78 employees were targeted to answer simple questions of which only 13 responded based on their experience. Most of them did not want to reveal their identity stating sensitivity of the topic. The other reasons for low response were that many of the staff were expatriates and were either sent away on long holidays or had lost their jobs. All the respondents belonged to top travel agencies in Muscat that have been in business for 10 or more years. Hence it was concluded that the number of agencies who participated in the research gave enough insight to give enough information to support the research.

Findings

Table 2 Demographic details of the respondents

Characteristics		Frequency	%
Rating of the Agencies	1star	2	15.4
	2 star	3	23.1
	3 star	5	38.5
	4 star	3	23.1
Operating for	Less than 5 years	2	15.4
	5 – 10 years	2	15.4
	>10 years	9	69.2
Awareness of Travel agents in Oman about NDC	Don't know	2	14.5
	Not at all aware of	1	7.7
	Somewhat aware	8	61.5
	Very much aware	2	14.5
Awareness of Travel agents in Oman about business change NDC offers	Don't know	2	14.5
	Not at all aware of	1	7.7
	Somewhat aware	8	61.5
	Very much aware	2	14.5
Your opinion about the business development through NDC in the coming years	Very Pessimistic	2	14.5
	No comments as things are not clear	7	53.8
	Very Optimistic	4	30.8
Preferred mode	NDC	2	14.5
	Usual GDS	2	14.5
	NDC with GDS	9	69.2

Source: Questionnaire

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Table 3 Perceptions of the Benefits through NDC

Statements	SD	D	N	A	SA	KS value	p-value
1. Increased Productivity	1 7.7%	2 14.5%	5 38.5%	4 30.8%	1 7.7%	.212	.113
2. More competitive	0 0%	3 23.1%	5 38.5%	4 30.8%	1 7.7%	.214	.107
3. Better Customer Service	1 7.7%	2 14.5%	3 23.1%	6 46.2%	1 7.7%	.272	.009
4. User friendly	2 14.5%	1 7.7%	5 38.5%	4 30.8%	1 7.7%	.243	.034
5. Access to the entire airline's product portfolio and ancillaries	3 23.1%	3 23.1%	4 30.8%	1 7.7%	2 14.5%	.181	.200
6. Work with real-time details	2 14.5%	4 30.8%	3 23.1%	3 23.1%	1 7.7%	.195	.190
7. To offer improved facilities to customers, based on product/service rather than price	0 0%	4 30.8%	4 30.8%	4 30.8%	1 7.7%	.189	.200
8. Offer personalized services based on travel history and choices	0 0%	2 14.5%	7 53.8%	2 14.5%	2 14.5%	.320	.001
9. Billing and Settlement Plan Reporting	1 7.7%	3 23.1%	5 38.5%	2 14.5%	2 14.5%	.218	.091
10. Cost effective	0 0%	4 30.8%	5 38.5%	2 14.5%	2 14.5%	.250	.026
11. Better Revenue than GDS	0 0%	2 14.5%	6 46.2%	3 23.1%	2 14.5%	.271	.010

Table 3 shows the choices of the respondents based on the perceived benefits of the respondents through NDC after carrying out the Kolmogorov-Smirnov ranking test. The statements whose p-value > 0.05 were eliminated and the statements whose p-value < .05 were only considered for ranking (highlighted in green color). These statements were ranked highest to lowest based on their KS values. From table 3, it is clear from the responses that the statement 'Offer personalized services based on travel history and choices (0.320)' ranked first as the most beneficial while using NDC. This was closely followed by the statement 'Better Customer Service' (0.272). The statement 'Better Revenue than GDS' ranked as third.

Table 4 Perception of the Benefits through GDS

Statements	SD	D	N	A	SA	KS value	p-value
1. Increased Productivity	3 23.1%	6 46.2%	2 14.5%	0 0%	2 14.5%	.306	.002
2. More competitive	1 7.7%	6 46.2%	4 30.8%	0 0%	2 14.5%	.259	.017
3. Better Customer Service	2 14.5%	7 53.8%	2 14.5%	1 7.7%	1 7.7%	.327	.000
4. User friendly	2 14.5%	7 53.8%	2 14.5%	1 7.7%	1 7.7%	.327	.000
5. Access to the entire airline's product portfolio and ancillaries	3 23.1%	5 38.5%	2 14.5%	2 14.5%	1 7.7%	.258	.018
6. Work with real-time details	4 30.8%	4 30.8%	2 14.5%	2 14.5%	1 7.7%	.230	.059
7. To offer improved facilities to customers, based on product/ service rather than price	3 23.1%	4 30.8%	3 23.1%	2 14.5%	1 7.7%	.203	.146

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8. Offer personalized services based on travel history and choices	3 23.1%	4 30.8%	4 30.8%	1 7.7%	1 7.7%	.188	.200
9. Billing and Settlement Plan Reporting	5 38.5%	3 23.1%	3 23.1%	0 0%	2 14.5%	.203	.145
10. Cost-effective	2 14.5%	4 30.8%	4 30.8%	2 14.5%	1 7.7%	.182	.200
11. Better Revenue than NDC	3 23.1%	3 23.1%	7 53.8%	0 0%	0 0%	.229	.000

Table 4 shows the choices of the respondents based on the perceived benefits of the respondents through GDS after carrying out the Kolmogorov-Smirnov ranking test. The statements whose p-value > 0.05 were eliminated and the statements whose p-value < .05 were only considered for ranking (highlighted in green color). These statements were ranked highest to lowest based on their KS values. From Table 4, it is clear from the responses that the statements 'User friendly' and 'Better Customer Service' both ranked first (0.327). These statements were followed closely by the statement 'Increased Productivity' ranked second (0.306). The statement 'More competitive' ranked third (0.259).

Interviews

While the research is targeting travel agencies in Oman, a few of the other players were also contacted to get a more holistic view of what was happening on the ground:

1. Senior person experienced with both Sabre and NDC

#	Questions	Opinion
1	About NDC	The main problem with travel agents in Oman is that they misunderstood NDC as a competition to GDS. They were worried about the loss of profit as customers get direct access to airline booking. But he felt that being a global system. NDC being dynamic and can adapt to changes demanded/required by the user very quickly (in a week or 2). Oman's national Carrier Oman Air has designed its portal and has made booking easily accessible to both IATA registered agents and small players who are not accredited IATA travel agents. With more Airlines from the Middle East signing up for NDC he believed that travel agents must adapt themselves to the NDC.
2	About GDS	GDS takes time to change (as it is based on international needs). It is not focused on the regional player. Oman is a small market for them, hence GDS may not be able to stay sustainable in the future.
3	Other	Post-COVID, the customer is more aware of direct online purchasing instead of relying on agents and thus saves money. Hence, he felt that there is no looking back and working like in pre-NDC days if TMC s wanted to stay in business.

2. GDS Support Services (2 persons)

#	Questions	Opinion
1	About NDC	Both agreed that operations through NDC is good but many of the travel agents were not aware of it. One of them chooses to work with NDC. They agreed that NDC has various benefits like increased productivity, user-friendliness, real-time working, billing advantage, competitiveness.
2	About GDS	They believed that though the future is not clear, GDS will survive only if NDC is incorporated. One of them preferred GDS over NDC.
3	Post COVID	The only area there was a difference of opinion was in Revenue generation. While one agreed NDC helped in revenue generation the other disagreed.

3. Representative of an airlines (which launched NDC in a big way in 2019)

#	Questions	Opinion
1	About NDC	There is awareness amongst travel agents in Oman about NDC in the travel industry and they were also aware of the changes it could bring about to the business. Very optimistic about NDC's future growth in Oman. NDC is very user-friendly because it was based on real-time principal as well as transparency in a way that all the airline products could be accessed using this system against GDS. NDC's revenue earning capacity was better and cost-effective too as compared to GDS
2	About GDS	While he strongly felt, he was slightly more cautious when it came to agreeing that NDC offered improved capability to customers that are based on product/services.
3	Post COVID	NDC helped in offering personalized services based on full travel history and preferences.

Discussion

From the quantitative analysis, the obtained result was as follows:
Among the perceived benefits of the respondents through NDC, 'Offer personalized services based on travel history and choices' ranked first followed by 'Better Customer Service' and 'Better Revenue than GDS'. Among the perceived benefits of the respondents through GDS, 'User friendliness' and 'Better Customer Service' both ranked first followed by 'Increased Productivity' and 'More competitiveness'.

From the qualitative analysis, it was learnt that
NDC being dynamic, user friendly and on real-time basis, it can adapt to changes demanded/required by the user very quickly. It offers improved capability to customers and personalized services based on full travel history and preferences. However, only few consider it as good but many of the travel agents are not aware of it as there is a misunderstanding of NDC as a competition to GDS and the agencies were worried more about the loss of profit. Only Oman Air has designed its portal in line with NDC. As Oman is a small market GDS may not sustain in the future. With more airlines from the Middle East signing up for NDC, it is suggested that travel agencies must adapt themselves to the NDC.

Conclusion

From the research it is clear that there is not much clear information available on NDC. Though most of the stakeholders insist that there is awareness unless there is practical experience the travel agents will not be willing to adapt. Also, awareness will make them open to the investment of both time and money that is required to adapt. Major airlines with offices in Oman should also support them in every possible way as the industry.

The findings show that travel agents perceived that with NDC they could offer more personalized services. But they still felt that GDS enables them to give better access to the entire airlines' product portfolio and ancillaries. With regards to areas like productivity, user-friendliness, and revenue benefits there was a mixed perception from them. This might be because the GDS service providers have apprised the travel agents mixing information between NDC and GDS. This echoes that the need for more guidance and workshops. Unfortunately, IATA has left this responsibility completely to the Airlines and IT platform providers.

Oman is a small market compared to its neighbour Dubai. Hence the adaptation of NDC is slow in Oman. As in other parts of the world, major airlines that fly in and out of Oman are trying to train and direct the travel agents to accept the system as the airlines see more benefit using the NDC platform.

In Oman, Oman Air along with TPConnect is optimistic about Oman's travel agents adapting the NDC system. They have together held a workshop to encourage and train the Omani travel agents towards NDC. They seem to have met with some success. The aggregator TPConnect claims that their new NDC-based Travel aggregate platform will give travel agents worldwide access to airline content. The company caters to some of the big companies worldwide and is offering a Travel B2B platform with minimal upfront investment (TradeArabia News Service, 2020).

As of date, all major airlines from the Middle East like Qatar Airways, Emirates, Etihad, and Oman Air are NDC certified. Hence, they are offering incentives to travel agents to start adopting NDC. Post pandemic can see more airlines adopting NDC due to its promise to reduce distribution costs and increase revenues. Though this is good, many of the airlines are like Emirates airlines have announced that agents who do not use their gateway can still access it through EDIFACT but at a nominal charge, to mitigate the airlines' costs for using the GDS system (TradeArabia News Service, 2021).

Suggestions

It is evident that a lot needs to be done to motivate all the players. Though in 2015 itself IATA recognized that travel agents had concerns, they made the airlines and NDC providers responsible to address these issues. This move of IATA has not been effective. IATA being the main organization should have shouldered more responsibility. Nevertheless, it is not too late, and it should step in now and provide more support in whatever possible to small players in smaller markets. It can be in any form like discounts in certification, communication, awareness campaign, and more research involving small players. With Pandemic leaving a trail of destruction it should become part of IATA's social responsibility to be more emphatic towards the travel agents at least for the time being.

As NDC cannot be implemented without technology to develop the products, GDS providers which already have a huge influence on the market are adapting themselves to the changes. GDS providers are being more proactive by incorporating and developing NDC into GDS. Similar to the suggestion made by Phocuswright's Norm Rose, travel advisors should step in at least for the time being to get involve with the GDS's efforts to implement NDC (Biesiada, 2019), as it seems its GDS with NDC is the clear winner in Oman as well as globally.

The cost of integration is high because Airlines and IATA largely focused on the level 3 Connectivity which is named Offer and Management. This required major booking flow redesign and required the travel agents to invest in NDC interface adaptation and costly IT integration. It seems that the cost and difficulty of integration will remain quite high and may be difficult for some parties to address. This needs to be considered as suggested by Cyril Tetaz, Head of Commercial, Asia Pacific Airlines, Amadeus (Gupta, 2017). Though NDC can be offered to travel agents without certification, the very fact that there is certification present will bring in pressure on the travel agents to get the certification to not lose out their credibility. This is an additional cost that IATA should at least in the initial year should subsidize, to reduce the financial burden at encouraging more TMCs to adopt NDC.

NDC promises to save time and resources needed to source and analyze flight details – leaving more time to spend on other client travel details like lodging, tour activities, etc. There are offerings to normalize different schema versions in real-time. This would enable connections between airlines and aggregators as well even if the aggregator and the IT player were at different levels of their certification. This means there will be backward and forward compatibility (Gupta, 2017).

Most of the travel agencies in Oman as in other parts of the world want to increase as well as maintain their current traveler client base. Post pandemic, most travellers will be more cost-conscious and techno-savvy than ever. Being able to connect directly to airlines will mean those travel agents will lose some of their customers. This means travel agencies need a system that will help them provide fast and competitive services. To do this they need an easy and smooth access to all available contents in a single-window be it GDS, Airline websites, or other intermediaries. They hold the data insights of not only individual but also corporate consumers. Added to this they would also like to see that their brand equity appreciates.

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