Programmatic Marketing Forecasts

2019

Zenith
The ROI agency

About Zenith

Zenith is The ROI agency. We blend data, technology and brilliant specialists to scout out new opportunities, solve complex challenges and grow our client's businesses. Zenith is part of Publicis Media, one of four solution hubs within Publicis Groupe, and has offices within Publicis One. We have over 6,000 brilliant specialists across 95 markets. We are experts in communications & media planning, content, performance marketing, value optimisation and data analytics. Zenith works with some of the world's leading brands including Electrolux, Essity, Kering, Lactalis, Luxottica, Nestlé, Nomad Foods, Oracle, Perrigo and RB.

Programmatic Marketing Forecasts 2019

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Contents

Zenith is pleased to introduce the fifth edition of its *Programmatic Marketing Forecasts.*

We now forecast that 69% of all money spent on advertising in digital media in 2020 will be traded programmatically, up from 65% in 2019. The total amount spent programmatically will exceed US$100bn for the first time in 2019, reaching US$106bn by the end of the year, and will rise to US$127bn in 2020 and US$147bn in 2021, when 72% of digital media will be programmatic. Here, digital media refers to all forms of paid-for advertising within online content, including banners, online video and social media, but excluding paid search and classified advertising.

Expansion of programmatic adspend is slowing, falling from 35% in 2018 to 22% in 2019, and forecast at 19% in 2020 and 16% in 2021. The programmatic industry faces challenges that need resolution before marketers, publishers and consumers realise its true potential.

Balancing privacy and personalisation

The first challenge is to develop new technology and processes that better balance consumers' need for privacy with the benefits of targeting and personalisation. GDPR in the EU has made some forms of personal data unavailable. The California Consumer Privacy Act, which comes into force in January, will further this issue. Meanwhile, some browsers are blocking the third-party cookies that programmatic advertising traditionally relied upon for measurement, insights, targeting and retargeting.

The industry needs to rethink the way it designs targeting and personalisation while respecting consumers' privacy rights. High-quality, first-party data is vital.

Cleaning up the supply path

There are too many ad tech entities that sit on the supply path between publishers and brands, charging fees, and providing unknown value due to their lack of transparency. Brands and buyers should review every platform they contract with, to ensure they contribute to campaign goals transparently and effectively. They should end their relationship with platforms that do not.

Unlocking the potential of first-party data and customer data platforms (CDPs)

As third-party data becomes commoditised and less efficient, brands are stepping up collection of first-party data, provided directly by consumers or produced indirectly by activity on websites, CRM programmes and other brand-owned sources. Because this is unique to each brand, first party data can provide true competitive advantage. CDPs organise a brand's first-party data from customer contacts, and with the right connections, can be activated into the programmatic trading ecosystem, allowing brands to address customers' individual preferences. However, it's important to connect CDPs to other sources of data for a complete view of each customer and continually measure performance to deliver true people-based marketing. Increased use of first-party data and CDPs, in combination with other assets, will make programmatic marketing more effective and attract higher levels of investment from brands.

Leveraging programmatic media for brand-building campaigns as well as short-term performance campaigns

Suitable high-engagement formats are now more widely available online, while the technology that opens up digital out-of-home and addressable television to programmatic techniques are starting to create real value for advertisers.

Programmatic marketing by country

The UK and the US are the most advanced programmatic markets in share of digital media, where respectively, 87% and 82% of digital media will trade programmatically in 2019. By 2021, Denmark, France and Germany will join them in having more than 80% of digital media trade programmatically.

The US is by far the largest programmatic market by adspend, worth US$67bn this year, accounting for 64% of all programmatic adspend, and responsible for most of the growth. The US is forecast to contribute 56% of new programmatic ad dollars in 2020. China is second with US$10bn in 2019, followed by the UK with US$7bn. Programmatic trading will account for only 30% of digital media adspend in China this year, but Zenith forecasts it to rise to 41% in 2021, when its programmatic spending will reach US$16bn.

Summary tables

Worldwide summary

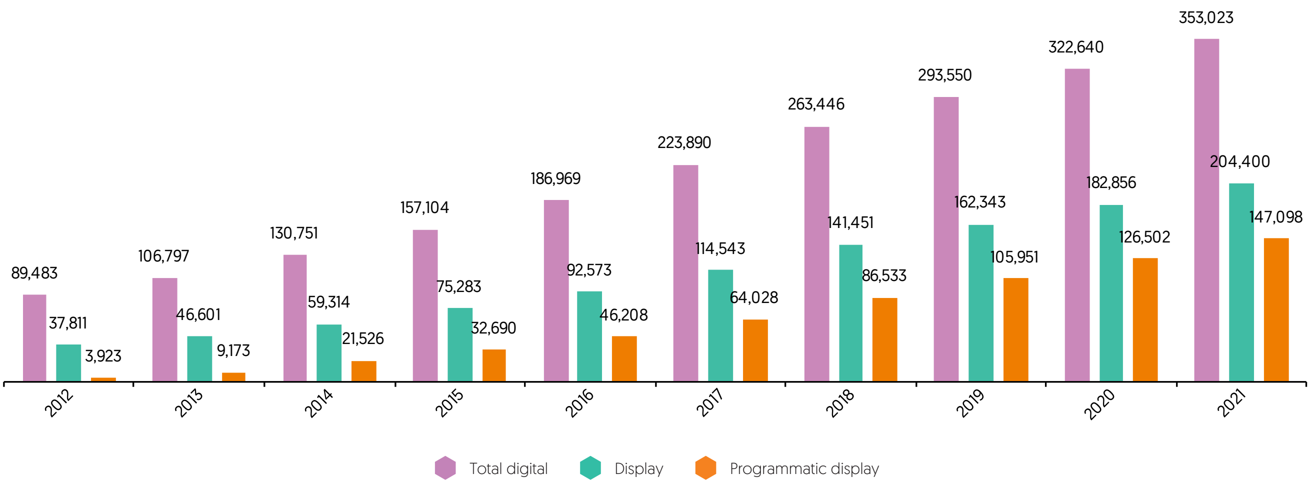
Global advertising spend (US$ million)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	89,483	106,797	130,751	157,104	186,969	223,890	263,446	293,550	322,640	353,023
Display	37,811	46,601	59,314	75,283	92,573	114,543	141,451	162,343	182,856	204,400
Programmatic display	3,923	9,173	21,526	32,690	46,208	64,028	86,533	105,951	126,502	147,098

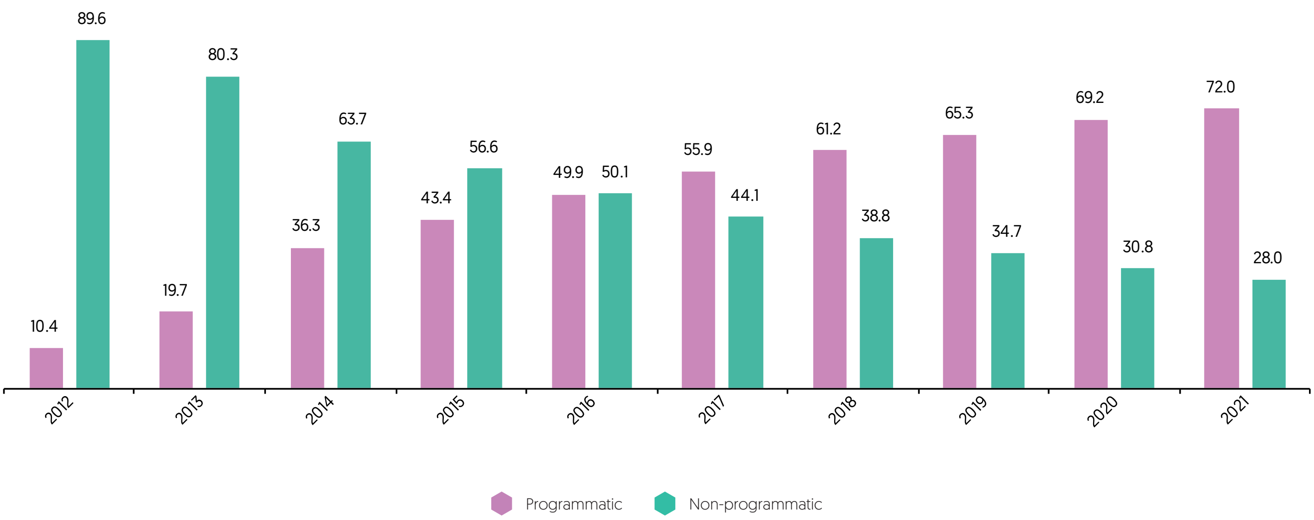
Share of digital display spend (%)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Programmatic	10.4	19.7	36.3	43.4	49.9	55.9	61.2	65.3	69.2	72.0
Non-programmatic	89.6	80.3	63.7	56.6	50.1	44.1	38.8	34.7	30.8	28.0

Global advertising spend (US$ million)



Share of digital display spend (%)



Country summary

Programmatic advertising spend (US$ million)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Armenia	-	0.1	0.2	0.3	0.4	1	1	1	1	1
Australia	61	152	239	337	518	796	1,431	1,731	2,117	2,406
Austria	1	3	8	15	58	75	92	111	129	146
Bosnia & Herzegovina	-	-	-	1	1	1	2	2	3	3
Bulgaria	-	-	1	1	1	2	2	3	4	5
Canada	-	-	377	777	1,105	1,455	1,751	1,898	2,133	2,360
China	83	231	732	1,740	3,103	5,023	7,438	10,141	13,183	15,934
Colombia	-	-	-	-	2	5	7	8	11	13
Denmark	-	50	94	159	209	276	326	342	407	492
Ecuador	1	1	6	8	9	10	11	11	14	17
Estonia	0.1	0.1	0.3	4	6	12	13	14	15	17
Finland	17	18	20	45	67	92	147	179	235	261
France	61	138	311	500	755	1,064	1,554	2,020	2,505	2,930
Germany	-	-	330	510	871	1,292	1,613	2,293	2,908	3,618
Hong Kong	-	-	8	21	47	101	162	220	286	372
Hungary	-	-	0.3	2	4	7	10	14	20	28
India	-	-	-	24	52	79	113	178	304	463
Italy	8	50	108	226	308	427	588	692	812	900
Latvia	-	-	-	-	-	6	7	8	10	11
Lithuania	-	-	-	-	-	9	12	17	22	24
Malaysia	-	-	29	37	47	59	81	108	136	158
Moldova	-	-	-	-	0.01	0.1	0.1	0.2	0.2	0.3
Netherlands	89	123	170	221	265	311	345	372	390	404
New Zealand	2	3	4	5	20	38	50	57	61	66
Norway	-	-	-	-	80	92	114	137	155	185
Poland	-	-	-	12	69	107	140	170	200	228
Puerto Rico	-	-	-	-	-	-	4	6	8	10
Romania	-	-	-	1	1	4	5	9	9	9
Russia	-	-	110	146	205	295	397	464	527	569
Serbia	-	-	-	6	8	12	18	22	26	30
Slovakia	-	-	1	4	7	12	17	24	28	31
Spain	-	62	60	102	158	184	325	377	445	529
Sweden	-	-	36	79	158	214	255	322	380	414
Switzerland	-	-	4	16	36	75	134	180	233	279
Taiwan	-	-	-	-	223	317	391	451	504	538
Turkey	-	-	-	4	12	107	201	230	256	317
Ukraine	-	1	1	2	6	13	29	52	78	112
United Kingdom	317	683	1,520	2,553	3,621	4,127	5,945	6,687	7,475	8,017
United States of America	2,278	5,534	14,344	21,443	29,770	42,130	55,687	67,342	78,943	91,095
Global	**3,923**	**9,173**	**21,526**	**32,690**	**46,208**	**64,028**	**86,533**	**105,951**	**126,502**	**147,098**

Display advertising spend (US$ million)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Armenia	1	1	1	2	2	2	2	3	3	4
Australia	655	842	1,087	1,586	2,010	2,456	2,861	3,147	3,305	3,437
Austria	168	193	216	242	268	298	320	336	351	367
Bosnia & Herzegovina	1	2	2	2	2	2	3	4	4	4
Bulgaria	-	10	16	25	29	26	28	31	34	36
Canada	823	1,003	1,188	1,476	1,846	2,508	2,927	3,078	3,273	3,350
China	5,724	7,415	10,591	15,512	20,183	25,078	30,392	33,652	36,381	38,830
Colombia	29	34	38	37	41	114	142	165	180	193
Denmark	229	248	284	318	349	394	435	455	496	550
Ecuador	2	5	14	14	21	24	41	51	61	74
Estonia	14	14	16	23	24	28	31	33	37	41
Finland	167	180	135	181	222	262	306	325	362	401
France	872	890	1,132	1,242	1,422	1,714	2,332	2,735	3,123	3,500
Germany	1,402	1,726	1,942	2,215	2,722	3,151	3,225	3,640	3,965	4,290
Hong Kong	58	163	269	354	389	529	665	878	1,159	1,530
Hungary	56	67	78	86	107	127	145	162	178	194
India	80	176	225	296	497	617	820	1,119	1,383	1,597
Italy	1,057	1,199	1,242	1,340	1,462	1,632	1,926	2,103	2,326	2,529
Latvia	-	-	-	-	-	18	19	19	20	22
Lithuania	13	15	19	24	31	36	39	45	49	53
Malaysia	-	-	114	124	151	204	252	277	306	376
Moldova	-	-	-	-	-	-	-	-	-	-
Netherlands	562	614	688	716	767	809	860	912	950	990
New Zealand	79	94	97	116	134	125	125	128	129	129
Norway	216	261	288	297	399	462	577	644	713	788
Poland	-	-	-	312	348	392	455	499	559	618
Puerto Rico	25	40	47	50	55	49	54	56	58	61
Romania	7	8	9	11	12	15	18	20	22	25
Russia	329	375	381	394	444	548	638	683	726	772
Serbia	12	14	16	18	21	25	31	37	42	48
Slovakia	41	47	53	53	68	87	94	97	99	102
Spain	463	425	548	707	877	927	1,122	1,211	1,325	1,495
Sweden	297	318	435	494	539	587	627	659	712	776
Switzerland	174	190	215	265	274	289	298	322	358	389
Taiwan	269	295	380	456	654	835	977	1,061	1,131	1,189
Turkey	79	92	105	124	153	262	298	334	391	466
Ukraine	-	38	40	47	66	88	118	148	173	212
United Kingdom	1,974	2,438	3,234	4,353	5,029	5,581	7,011	7,687	8,408	9,156
United States of America	16,840	21,212	26,993	34,143	42,208	54,987	69,608	81,711	93,395	106,204
Global	**37,811**	**46,601**	**59,314**	**75,283**	**92,573**	**114,543**	**141,451**	**162,343**	**182,856**	**204,400**

Programmatic share of display advertising spend (%)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Armenia	-	11.1	14.3	17.6	25.0	30.0	29.2	25.0	25.0	33.3
Australia	9.2	18.0	22.0	21.3	25.8	32.4	50.0	55.0	64.1	70.0
Austria	0.8	1.6	3.7	6.4	21.7	25.0	28.9	33.0	36.7	39.9
Bosnia & Herzegovina	-	-	-	26.9	50.4	52.8	55.4	68.3	69.5	68.8
Bulgaria	-	-	3.3	4.5	4.6	7.1	8.6	9.6	10.8	12.6
Canada	-	-	31.7	52.7	59.8	58.0	59.8	61.7	65.2	70.5
China	1.5	3.1	6.9	11.2	15.4	20.0	24.5	30.1	36.2	41.0
Colombia	-	-	-	-	5.2	4.7	4.6	5.0	5.8	6.8
Denmark		20.0	33.0	50.0	60.0	70.0	75.0	75.2	82.0	89.5
Ecuador	31.9	27.1	42.9	56.3	40.4	41.1	27.0	22.5	22.5	22.5
Estonia	1.0	1.0	2.0	16.6	24.2	43.4	42.0	42.9	41.9	40.2
Finland	10.0	10.0	15.0	25.0	30.0	35.0	48.0	55.0	65.0	65.0
France	7.0	15.5	27.5	40.2	53.1	62.1	66.6	73.9	80.2	83.7
Germany	-	-	17.0	23.0	32.0	41.0	50.0	63.0	73.3	84.3
Hong Kong	-	-	2.9	6.0	12.0	19.0	24.4	25.1	24.7	24.3
Hungary	-	-	0.4	2.5	3.5	5.3	6.9	8.9	11.4	14.2
India	-	-	-	8.1	10.4	12.8	13.8	15.9	22.0	29.0
Italy	0.8	4.2	8.7	16.9	21.0	26.2	30.5	32.9	34.9	35.6
Latvia	-	-	-	-	-	32.0	37.0	42.0	50.0	48.8
Lithuania	-	-	-	-	-	24.3	31.4	38.1	45.0	45.0
Malaysia	-	-	25.1	30.1	31.0	29.0	32.0	38.8	44.3	42.0
Moldova	-	-	-	-	-	-	-	-	-	-
Netherlands	15.8	20.0	24.7	30.9	34.5	38.4	40.1	40.8	41.0	40.8
New Zealand	2.0	3.0	4.0	4.0	15.0	30.0	40.0	45.0	47.5	51.0
Norway	-	-	-	-	20.0	20.0	19.8	21.3	21.8	23.5
Poland	-	-	-	3.9	19.8	27.2	30.8	34.0	35.7	36.9
Puerto Rico	-	-	-	-	-	-	7.0	10.4	13.6	16.4
Romania	-	-	-	4.8	10.2	25.0	30.4	42.5	40.2	37.2
Russia	-	-	29.0	37.1	46.2	53.8	62.1	68.0	72.6	73.6
Serbia	-	-	-	35.5	40.0	47.2	59.5	61.2	62.1	61.2
Slovakia	-	-	2.2	6.7	10.4	13.6	17.7	24.4	28.4	30.8
Spain	-	14.5	10.9	14.4	18.0	19.8	29.0	31.2	33.6	35.4
Sweden	-	-	8.2	16.1	29.2	36.5	40.8	48.9	53.3	53.3
Switzerland	-	-	2.0	6.0	13.0	26.0	44.9	56.0	65.1	71.9
Taiwan	-	-	-	-	34.1	38.0	40.1	42.5	44.6	45.3
Turkey	-	-	-	3.3	7.9	40.7	67.4	68.9	65.3	68.0
Ukraine	-	2.0	3.0	4.8	9.7	15.0	25.0	35.0	45.0	53.0
United Kingdom	16.0	28.0	47.0	58.6	72.0	74.0	84.8	87.0	88.9	87.6
United States of America	13.5	26.1	53.1	62.8	70.5	76.6	80.0	82.4	84.5	85.8
Average	**10.4**	**19.7**	**36.3**	**43.4**	**49.9**	**55.9**	**61.2**	**65.3**	**69.2**	**72.0**

Country entries

Argentina

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	-	1.28
Display	-	-	-	-	-	-	0.88
Mobile	-	-	-	-	-	-	1.19
Video	-	-	-	-	-	-	4.50
Social*	-	-	-	-	-	-	0.91

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	-	0.52
Display	-	-	-	-	-	-	0.35
Mobile	-	-	-	-	-	-	0.35
Video	-	-	-	-	-	-	1.00
Social*	-	-	-	-	-	-	0.47

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	-	0.20
Display	-	-	-	-	-	-	0.17
Mobile	-	-	-	-	-	-	0.28
Video	-	-	-	-	-	-	0.35
Social*	-	-	-	-	-	-	0.20

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	-	34.87

*Source: Zenith estimates   * TrueView*

The two main programmatic players in Argentina are DV360 and Mediamath. Several other smaller players have emerged over the past year though. Google's Campaign Manager continues to be the most important ad server in the industry. With regards to DMPs, Retargetly offers the best solutions.

Currently, the trend in programmatic is for self-service. We don't outsource investment and all our work is created and activated in-house.

There is more knowledge about programmatic in the market now, thanks to a higher standard of training and improvements to the resources dedicated to teaching.

There is still some lack of knowledge from advertisers, though, around the use and benefits of programmatic, but we have seen growth thanks to our teams working face to face with different brands.

We still need more support, however, and platforms that respond to the goals of the advertisers. It is necessary for advertisers to use more programmatic technology. The industry actually took great steps to develop personalization ads, but some advertisers are not using them in the correct way.

The publishers have adapted to programmatic, and have more formats to buy. This means that the direct purchase versus programmatic 'fight' is over.

In terms of type of deal, we are in a transition period now, where we are moving away from private auction and running most PMPs in the preferred deal format. With this way of working, we have better results.

Within traditional media channels, only programmatic on TV is in the pipeline currently.

In five years, we think there will be better use of data and analytics, and with this a big difference in strategy.

Armenia

Forecasts

Advertising spend (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	0.5	0.9	1.4	1.7	1.6	2.0	2.4	3.2	3.2	3.6
Total display	0.5	0.9	1.4	1.7	1.6	2.0	2.4	3.2	3.2	3.6
Banners + other traditional display	*0.4*	*0.6*	*1.0*	*1.2*	*1.1*	*1.4*	*1.7*	*2.3*	*2.3*	*2.6*
Video	*0.1*	*0.2*	*0.3*	*0.4*	*0.4*	*0.5*	*0.6*	*0.8*	*0.8*	*0.9*
Native	*0.0*	*0.0*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.2*

Programmatic spend (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	0.1	0.2	0.3	0.4	0.6	0.7	0.8	0.8	1.2
Banners + other traditional display	-	*0.1*	*0.2*	*0.2*	*0.3*	*0.4*	*0.5*	*0.5*	*0.5*	*0.7*
Video	-	-	-	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.4*
Native	-	-	-	-	-	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*

Programmatic spend by type of deal (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	0.1	0.2	0.3	0.4	0.6	0.7	0.8	0.8	1.2
Private marketplaces	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preferred deals	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guaranteed	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Top five buy side technology in market

1 Doubleclick
2 Adfox
3 Digisales
4 Eskimi
5 Yandex

Top five sell side vendors in market

1 Google AdSense
2 AdFox
3 Doubleclick
4 AdMob
5 Yandex

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.08	0.10	0.16	0.16	0.16	0.18	0.21
Display	0.05	0.10	0.15	0.15	0.15	0.15	0.15
Mobile	0.10	0.12	0.12	0.12	0.12	0.12	0.20
Video	0.10	0.10	0.20	0.20	0.20	0.20	0.25
Social	0.05	0.08	0.15	0.15	0.15	0.23	0.25

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.08	0.08	0.06	0.06	0.06	0.06	0.06
Display	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Mobile	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Video	0.11	0.10	0.05	0.05	0.03	0.03	0.03
Social	0.10	0.10	0.10	0.10	0.10	0.10	0.10

Average programmatic CTR by media channel (%)

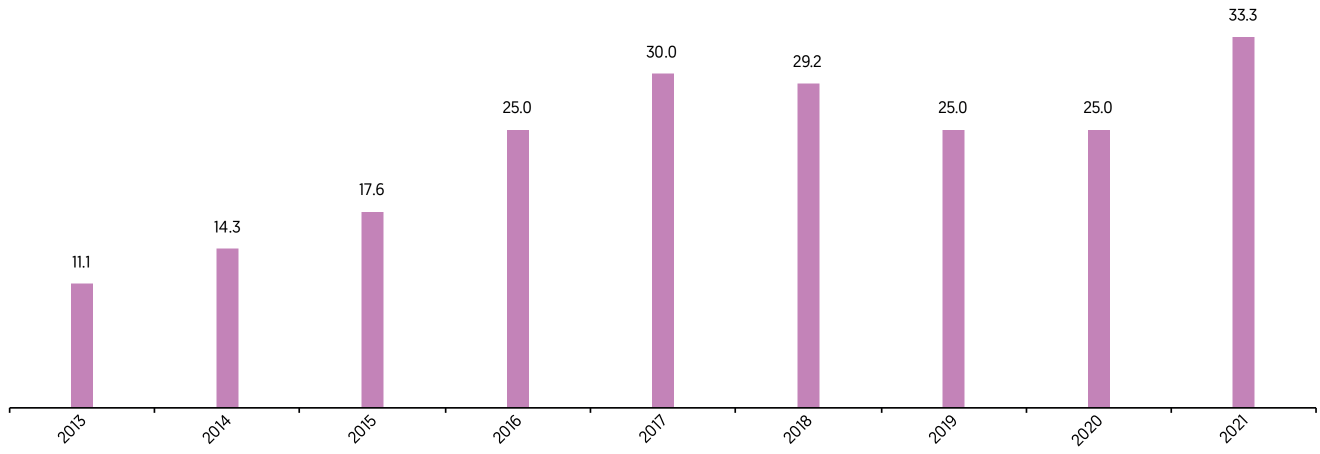
	2012	2013	2014	2015	2016	2017	2018
Overall	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Display	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Mobile	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Video	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Social	0.50	0.50	0.50	0.50	0.50	0.50	0.50

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	30.0	30.0	35.0	45.0	50.0	54.0	52.0

Source: Zenith estimates

Programmatic share of display advertising spend (%)



Programmatic buying in Armenia is still in the early stages of development. DSP adoption is high.

Currently, the market is keener on managed-service providers, as they provide access to skilled expertise, help reduce overheads, and increase efficiency.

In Armenia the online advertising market is gradually getting more technology driven, therefore programmatic is in more demand. Programmatic allows for transparent reporting, real time measurement, increased audience reach, greater targeting capabilities, easy-to-share dashboards, etc. But the most significant trend that helps drive programmatic growth is its reasonable pricing.

There is still a considerable lack of knowledge of programmatic, but the more it is implemented by agencies, the more clients want it for future campaigns. So the best way to increase awareness of it is to offer it to clients for any relevant campaign.

There are barriers, and it is of the utmost importance to make the interface simpler, as marketers need programmatic to ensure the best results for their clients.

We think that in the near future, programmatic has a chance to become the primary advertising tool for marketing agencies and organisations.

Currently, there are no services for programmatic TV or outdoor available in Armenia.

Australia

Forecasts

Advertising spend (AUD mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	3,343.0	3,986.0	4,798.0	6,015.0	7,397.0	8,351.0	9,362.5	10,054.6	10,440.4	10,797.8
Total display	876.0	1,125.0	1,453.0	2,120.0	2,687.0	3,283.0	3,824.3	4,206.7	4,417.1	4,593.7
Banners + other traditional display	*701.0*	*844.0*	*857.0*	*954.0*	*994.2*	*1,050.4*	*1,185.5*	*1,304.7*	*1,325.1*	*1,332.2*
Video	*175.0*	*281.0*	*581.0*	*1,124.0*	*1,612.4*	*2,134.1*	*2,485.8*	*2,735.0*	*2,915.3*	*3,077.8*
Native	-	-	*15.0*	*42.0*	*80.4*	*98.0*	*153.0*	*167.1*	*176.7*	*183.7*

Programmatic spend (AUD mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	81.0	203.0	319.0	451.0	692.0	1,064.0	1,912.1	2,313.7	2,830.1	3,215.6
Banners + other traditional display	*61.0*	*152.0*	*217.0*	*239.0*	*256.0*	*340.0*	*592.8*	*717.6*	*849.0*	*932.5*
Video	*20.0*	*51.0*	*99.0*	*203.0*	*415.0*	*692.0*	*1,242.9*	*1,504.2*	*1,867.9*	*2,154.5*
Native	-	-	*3.0*	*9.0*	*21.0*	*32.0*	*76.5*	*91.9*	*113.2*	*128.6*

Programmatic spend by type of deal (AUD mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	81.0	203.0	319.0	361.0	470.0	479.0	554.7	462.7	424.5	289.4
Private marketplaces	0.0	0.0	0.0	90.0	138.0	319.0	669.1	809.8	962.2	1,157.6
Preferred deals	0.0	0.0	0.0	0.0	15.0	53.0	114.3	138.8	169.8	192.9
Guaranteed	0.0	0.0	0.0	0.0	69.0	213.0	574.0	902.3	1,273.5	1,575.7

Top five buy side technology in market

1. Google Display & Video 360
2. The Trade Desk
3. MediaMath
4. AppNexus
5. Adobe DSP

Top five sell side vendors in market

1. DoubleClick Ad Exchange
2. Rubicon
3. PubMatic
4. Index Exchange
5. AppNexus

Source: Zenith, CEASA, IAB

Programmatic spend - emerging media channels (AUD mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Newspapers	-	-	-	-	-	-	-	-	-	-
Magazines	-	-	-	-	-	-	-	-	-	-
TV	-	-	-	-	-	-	182.0	528.0	1,014.0	1,223.1
Radio	-	-	-	-	-	-	-	-	68.0	122.1
Cinema	-	-	-	-	-	-	-	-	-	-
Out-of-home	-	-	-	-	-	-	-	-	99.8	254.5

Source: Zenith

Programmatic share of display advertising spend (%)

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012*	2013*	2014	2015	2016	2017	2018
Overall	1.64	1.63	2.15	4.28	6.58	8.13	11.14
Display	1.61	1.48	2.10	3.11	3.64	4.70	5.83
Mobile	0.50	0.75	1.04	1.58	5.35	5.30	6.64
Video	21.24	17.88	18.28	27.09	15.16	11.57	23.07
Social	-	-	2.71	7.60	8.71	10.19	11.55

Average programmatic CPC by media channel (US$)

	2012*	2013*	2014	2015	2016	2017	2018
Overall	2.36	2.16	2.83	1.07	1.06	1.16	1.30
Display	2.60	3.19	6.41	3.51	4.74	1.99	4.38
Mobile	0.28	0.23	0.53	0.91	3.61	2.64	4.71
Video	0.36	1.03	1.44	5.75	6.50	4.22	9.07
Social	-	-	0.47	0.53	0.63	0.90	1.21

Average programmatic CTR by media channel (%)

	2012*	2013*	2014	2015	2016	2017	2018
Overall	0.07	0.08	0.08	0.40	0.62	0.70	0.86
Display	0.06	0.05	0.03	0.09	0.08	0.24	0.13
Mobile	0.18	0.32	0.20	0.17	0.15	0.20	0.14
Video	1.56	1.73	1.27	0.47	0.23	0.27	0.25
Social	-	-	0.58	1.42	1.39	1.13	0.95

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	16.4	13.6	14.0	18.8	40.0	53.0	66.0

Source: Zenith estimates
** Joint figures for Australia and New Zealand*

The adoption of programmatic technology in Australia is strong. A large number of offerings bring with them fierce competition and provide strategic opportunities for clients.

Programmatic adoption levels have also been driven by the entry of Amazon's DSP [an offering crafted for media agencies and advertisers with inventory spanning display, video and search]. Given its success in North America, we expect strong investment from Australian brands. The earliest adopters will naturally be those brands whose products are stocked on Amazon's e-commerce site, such as electronic retailers. The DSP's arrival provides a good opportunity for audience addressability and closing the loop on the path to purchase.

Ongoing consolidation of adtech and martech will continue to drive competition in terms of stack simplification and as advertisers aim to achieve a single view of the customer.

Private marketplace buys have seen substantial growth, both due to increased demand for premium inventory and technological advancement on the supply side. Growth has been further fuelled by the addition of supply-side, first-party data, which has enriched the PMP market, making it more attractive to brands. This has benefited channels like video, and connected TV in particular.

Open source is bringing fair and unbiased competition, through the likes of header bidding, which provides increased control and transparency for buyers who need scalable solutions. Header bidding is now at 80%-90% penetration. This has given more rise to supply-path optimisation i.e. creating more direct routes to winnable inventory in RTB open marketplaces. In 2020, we expect to see the continued development of broader experimentation with in-app header bidding.

Education in the Australian marketplace is generally good, driven by supply-side and industry body initiatives. However, there is inconsistency in terms of information access, affecting the overall knowledge base. The fundamentals are there but when it comes to strategic implementation, there are widely differing levels of understanding and expectations.

Because of the scale that can be achieved, open auction buying is still the most common type of deal used in the market. This has been supported by significant advances in the development of a cleaner supply chain [e.g. ads.txt] and header bidding.

In terms of the publisher community, there are several key themes evident in the market:

1. Economy – The poor economic outlook will have some effect on growth in the short-term as publishers decide how to maintain revenue.
2. Data – An amendment to the Australian Data Privacy Act will probably come into effect in mid-2020. This will likely stall growth in the short-term as clients and publishers ensure they are fully compliant, as the legislation will fundamentally change the way the digital landscape operates.
3. Unknown effect of Amazon – We are yet to see the effect Amazon will have on publishers. The data offering they have is attractive to marketers so it will be interesting to see how this emerges from an ROI point of view.

The main driver of online programmatic uptake in future will be the 5G rollout. As the online user experience improves, the availability and range of formats will increase, pushing up programmatic adoption.

As programmatic continues to develop beyond online display ads to channels like DOOH, audio, connected TV, and more, media buyers will get a holistic life cycle view of the user, which is key to being able to deliver fewer, but more effective, ads.

From an online audio perspective, prospects for programmatic are good as supply has increased. We see this continuing as additional PMPs become available.

The online TV market is performing well. Programmatic growth will come from increased data segmentation and holistic measurement capabilities. Linear TV is unlikely to develop programmatic capabilities in the short- to medium-term, given the logistical challenges posed by a lack of technical infrastructure. Addressability at scale requires networks to be able to insert targeted ads into the linear feed by way of a set-top box. Since the penetration of up-to-date boxes is still limited, this is unlikely to become a reality in the near future. Furthermore, the level of advanced segmentation required to make the programmatic 'dream' a reality is still under development.

In the shorter term, we do expect programmatic OOH to take shape. Out-of-home vendors like JCDecaux are already offering agencies the option to buy digital outdoor panels programmatically in the UK. Given recent large-scale consolidation in the Australian marketplace, it is highly likely that such technologies will begin to take shape in Australia by 2021.

With regard to barriers, walled gardens will continue to challenge the industry. While they benefit the market, the concerns around data privacy and access to premium publisher content must be balanced to ensure there is strong market in the future. A consortium approach with all parties working together for the betterment of the industry is critical to creating a viable alternative to the walled gardens.

For clients heavily reliant on conversion tracking/attribution measurement, a further and growing hurdle will be the ongoing evolution of anti-tracking policies and consumer sentiment [e.g. Apple ITP 2.2, speculation on Chrome's policies to align with the market and Facebook's 3P clearing tool].

Austria

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	225.3	263.0	307.6	348.2	388.0	421.0	450.0	474.3	497.5	521.9
Total display	142.0	163.0	182.6	204.5	227.0	251.9	270.8	284.4	297.2	310.5
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	1.1	2.6	6.7	13.0	49.2	63.1	78.3	93.8	108.9	124.0
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	1.1	2.0	5.0	7.3	33.3	32.7	43.3	53.8	64.4	75.0
Private marketplaces	0.0	1.0	2.0	2.5	7.5	11.9	13.0	14.0	14.5	15.0
Preferred deals	0.0	0.0	0.0	0.0	0.6	3.9	5.0	6.0	6.5	7.0
Guaranteed	0.0	0.0	0.0	3.2	7.8	14.6	17.0	20.0	23.5	27.0

Top buy side technology in market

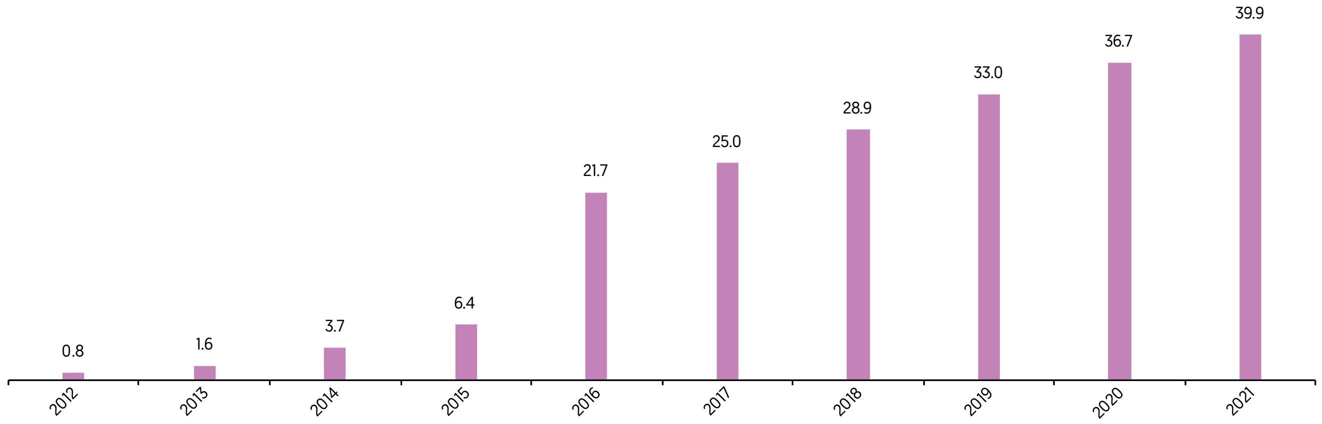
1	DV360
2	AdForm
3	MediaMath
4	TheTradeDesk

Top sell side vendors in market

1	Improve Digital
2	AppNexus
3	DoubleClick Ad Exchange
4	Yieldlab

Source: IAB Austria, Zenith estimates

Programmatic share of display advertising spend (%)



During the last few years, programmatic advertising has become a standard media planning and advertising strategy. The amount of inventory and the number of available data sources are increasing and pushing the market to grow faster. Those working in the Austrian market are looking at what happens in other markets and adapting this for their own needs.

There have been various local education initiatives focusing on programmatic. Interest is increasing continuously, but there is a lack of specialists. Detailed knowledge transfer happens mainly within the agencies and agency networks.

A huge variety of technology is available in Austria, but because the market is so small, most providers have appointed no dedicated local representatives.

Most ad networks offer a limited number of creative formats to the programmatic markets. Nevertheless, ad networks are working on new formats and new possibilities for programmatic advertising. Private marketplaces and preferred deals are becoming more and more important. Most local publishers sell their inventory as well in open auction as in private marketplaces.

2018 and 2019 have been challenging years for data-driven marketing, as participants have striven to comply with GDPR without losing momentum in development and competitiveness. Local publishers have tended to focus on PMP deals rather than open auction since GDPR.

Within traditional media channels programmatic buying is still rare. There are digital outdoor screens programmatically connected and the first programmatic radio campaigns have been aired.

Belgium

Top buy side technology in market

1	Display & Video 360
2	Adform
3	Appnexus

Top sell side vendors in market

1	Google Adex
2	Teads
3	Spotx
4	Freewheel

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	1.03	1.30	2.24	2.96	5.03	7.19	4.69
Display	1.03	1.30	1.54	1.55	3.10	4.94	2.51
Mobile	1.03	1.30	0.54	0.74	-	-	-
Video	1.40	2.15	11.26	9.59	11.74	11.49	9.89
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	1.40	2.08	0.77	0.83	2.25	2.53	1.86
Display	1.40	2.15	1.75	1.79	2.21	2.69	1.69
Mobile	1.40	2.15	0.18	0.19	-	-	-
Video	-	0.10	0.44	0.62	2.22	2.41	1.98
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.07	0.06	0.29	0.36	0.22	0.28	0.25
Display	0.07	0.06	0.09	0.09	0.14	0.18	0.15
Mobile	0.07	0.06	0.31	0.39	-	-	-
Video	0.07	0.06	2.55	1.54	0.53	0.48	0.50
Social	-	-	-	-	-	-	-

Belgium's programmatic market is nearing maturity – there is only one major media vendor that does not use programmatic now. More and more publishers have access to bigger inventory via programmatic. Agencies are focussing on PMPs and preferred deals to increase viewability and brand safety. Google dominates the market, but challengers, like Adform, provide interesting alternatives. Belgium remains a difficult market for DMPs because of its small size and bilingual population (hard to collect enough data points).

Programmatic knowledge in Belgium is slightly lower than in larger markets because some of the ad tech is not available in – or has come later to - our market. Nevertheless, agencies and publishers have good skills in programmatic.

Advertisers on the other hand have a limited understanding, except for the big advertisers, which have internal programmatic profiles.

There has been growth in the programmatic market, and we expect this trend to continue over the next few years. Even if publishers face lower revenues (pressure on CPMs), advertisers and agencies are driving this change to increase precision, get full flexibility in campaigns, and for investment optimization.

Barriers to growth include the lack of local targeted inventory. Due to small volumes, local publishers struggle to sell segmented audiences and to deliver campaigns with a medium targeting level (e.g. women 25-44, interest targeting, geo targeting). They can only propose a broad audience (e.g. all 25-54, women only), and advertisers look for precise audiences.

Self-service dominates for standard formats and solutions, as agencies and advertisers want to be in the driving seat to optimize media investments, and increase data ownership and internal knowledge. Independent trading desks (programmatic with managed service) are not gaining share of the market because advertisers and agencies lose access to transparency and data. Managed-service remains the preference, though, for tailor-made formats and approaches: influencer marketing, native content, and high impact formats (take over, high share of voice).

Over the past three years, agencies and big publishers have moved from open RTB to PMP in order to increase quality and control. Today, PMPs dominate for key players. Preferred and guaranteed deals are still limited to the top 10 advertisers.

Some key publishers in the market have started to collaborate with local competitors to create programmatic and data offers to compete against Facebook and Google. Because of the fragmented market, even the biggest local publisher has very limited inventory and access to tech to compete. So the only way to do this is by creating alliances and having bilingual offers that can reach the entire Belgian population.

At present, there are not many programmatic opportunities in traditional media. OOH and TV have started to sell precision marketing, but still as managed-service. We don't expect any major changes over the next two years, but internet service providers Proximus and Telenet could change the game quite quickly by starting to sell targeted TV ads based on their subscriber data.

Bosnia & Herzegovina

Forecasts

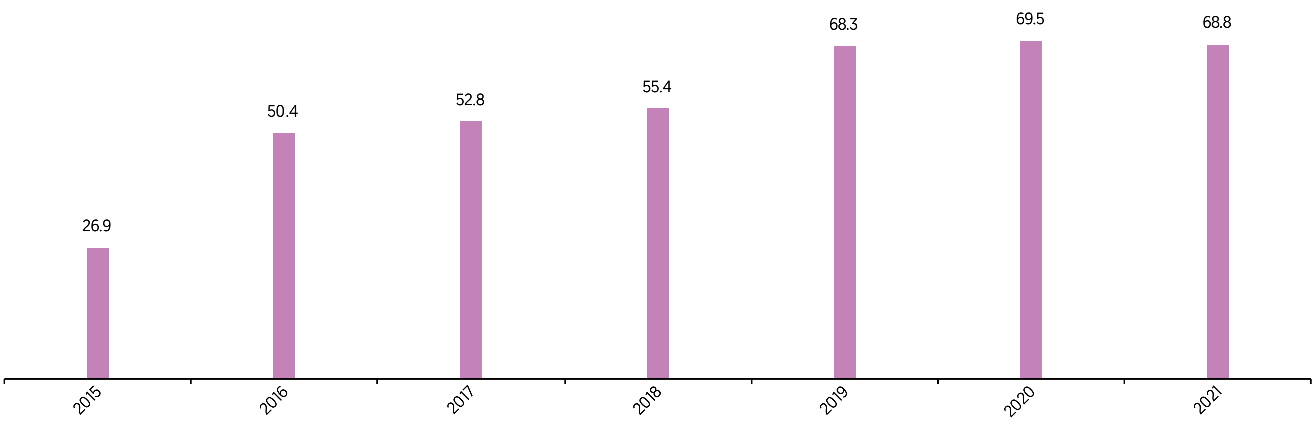
Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	1.6	2.0	3.1	3.2	3.3	3.5	3.6	3.7	4.1	4.6
Total display	1.1	1.4	1.6	1.9	2.0	2.0	2.9	3.0	3.2	3.4
Banners + other traditional display	-	-	-	-	-	*1.7*	*1.9*	*1.9*	*2.0*	*2.2*
Video	-	-	-	-	-	*0.3*	*0.9*	*0.9*	*1.1*	*1.1*
Native	-	-	-	-	-	-	*0.1*	*0.1*	*0.1*	*0.1*

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	0.5	1.0	1.1	1.6	2.0	2.2	2.4
Banners + other traditional display	-	-	-	-	*1.0*	*1.0*	*1.4*	*1.8*	*1.9*	*2.1*
Video	-	-	-	-	*0.01*	*0.1*	*0.2*	*0.2*	*0.3*	*0.3*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic share of display advertising spend (%)



There are no local programmatic technologies in Bosnia & Herzegovina. Some providers from Western European countries are offering programmatic solutions, but with poor local web inventory. So there are still a lot of possibilities for improvement. Local publishers are important for local audiences, but they are still not willing to open premium positions for programmatic platforms. The biggest issue, or barrier, is the lack of relevant data regarding users in Bosnia & Herzegovina.

Growth is mostly generated from targeted ads in Google and Facebook platforms.

In terms of knowledge and education, the market is still undeveloped with only basic levels of knowledge regarding programmatic.

Self-service is the dominant form of programmatic advertising. While the most common type of deal used is open market.

Bulgaria

Forecasts

Advertising spend (Lev mill)

	2012	2013	2014	2015	2016	2017*	2018*	2019	2020	2021
Total digital	28.1	31.4	37.8	42.6	62.9	75.1	98.0	112.0	128.0	145.0
Total display	-	16.4	26.2	41.8	48.3	43.5	46.7	51.9	55.5	59.5
Banners + other traditional display	-	*16.4*	*18.6*	*26.1*	*30.4*	*22.8*	*22.7*	*24.5*	*26.2*	*28.1*
Video	-	-	*7.6*	*15.7*	*16.4*	*18.5*	*21.4*	*24.5*	*26.2*	*28.1*
Native	-	-	-	-	*1.5*	*2.2*	*2.6*	*2.9*	*3.1*	*3.4*

Programmatic spend (Lev mill)

	2012	2013	2014	2015	2016	2017**	2018	2019	2020	2021
Total programmatic display	-	-	0.9	1.9	2.2	3.1	4.0	5.0	6.0	7.5
Banners + other traditional display	-	-	-	-	-	-	*1.8*	*2.0*	*2.5*	*3.0*
Video	-	-	-	-	-	-	*1.2*	*2.0*	*2.5*	*3.0*
Native	-	-	-	-	-	-	*1.0*	*1.0*	*1.0*	*1.5*

Programmatic spend by type of deal (Lev mill)

	2012	2013	2014	2015	2016	2017**	2018	2019	2020	2021
Open (RTB)	-	-	0.9	1.9	2.2	3.1	4.0	5.0	6.0	7.5
Private marketplaces	-	-	-	-	-	-	-	-	-	-
Preferred deals	-	-	-	-	-	-	-	-	-	-
Guaranteed	-	-	-	-	-	-	-	-	-	-

Top buy side technology in market

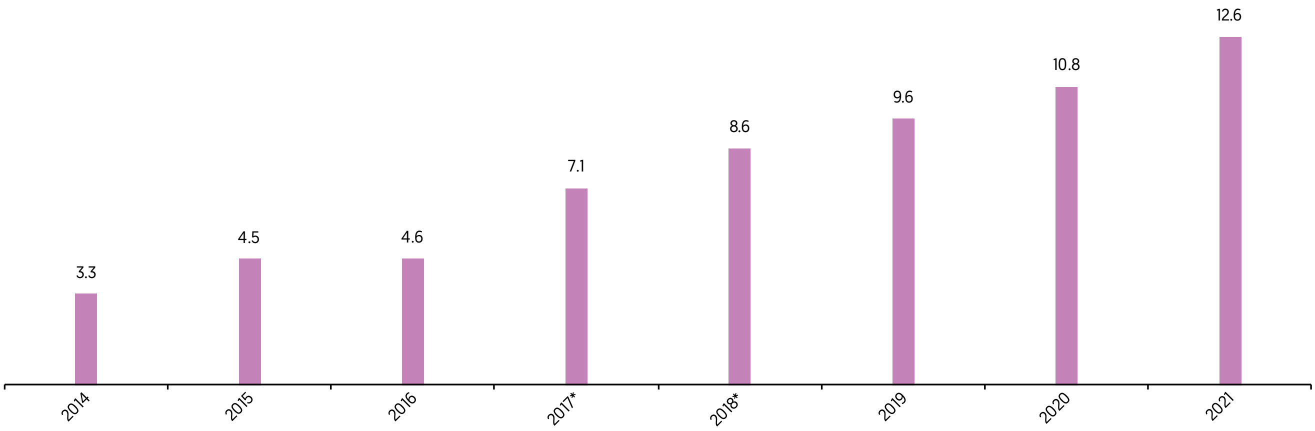
1 Display & Video 360
2 AdForm
3 AppNexus
4 Criteo

Top sell side vendors in market

1 DFP - Google AdExchange
2 Smart AdServer

Source: IAB 2018, Zenith
**IAB Bulgaria changed the methodology for 2017 and 2018 digital spend. The data for 2017 has been updated since the iAB Forum 2019.*
*** IAB Forum 2018*

Programmatic share of display advertising spend (%)



Most companies are using ad servers - like Gemius and Campaign Manager, which are the most widely used – for their campaign tracking. DMPs are still not widespread within the Bulgarian market, although SSPs are often used by publishers, with DFP being the most popular. DSPs are used mainly by the agencies, and a few companies offer only programmatic buying services.

There is no official data for programmatic spending in 2018 for Bulgaria, but our opinion is that there is growth. More and more local clients are adopting the technology due to its various targeting and performance capabilities.

Managed-service is common: the service providers (mostly agencies) have access to best-in-class technologies and have considerable experience, while few clients have sufficient staff or the requisite technology to buy programmatically in-house.

The leading deal-type is open auction.

In the next five years, programmatic investment will continue to grow. The main drivers of growth will be increased interest in the targeting and technological options available, as well as the increasing demand for custom segmented audience, premium inventory and viewability.

Canada

Forecasts

Advertising spend (CAD mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	3,073.0	3,408.0	3,782.0	4,599.0	5,485.0	6,771.5	7,500.0	7,813.5	8,300.1	8,492.4
Total display	1,066.0	1,299.0	1,540.0	1,912.0	2,392.0	3,250.0	3,793.0	3,988.6	4,240.5	4,340.6
Banners + other traditional display	*974.0*	*1,091.0*	*1,274.0*	*1,554.0*	*1,911.0*	*2,322.0*	*2,669.0*	*2,802.7*	*2,979.7*	*3,050.1*
Video	*92.0*	*208.0*	*266.0*	*358.0*	*481.0*	*928.0*	*1,124.0*	*1,185.9*	*1,260.8*	*1,290.5*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (CAD mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	487.9	1,007.2	1,431.6	1,885.0	2,269.5	2,459.2	2,763.9	3,058.6
Banners + other traditional display	-	-	*459.5*	*800.2*	*1,135.4*	*1,495.0*	*1,810.5*	*1,967.4*	*2,211.1*	*2,378.9*
Video	-	-	*28.4*	*207.0*	*296.2*	*390.0*	*459.0*	*491.8*	*552.8*	*679.7*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (CAD mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	346.4	674.8	859.0	1,131.0	1,361.7	1,426.3	1,603.1	1,774.0
Private marketplaces	-	-	141.5	332.4	572.6	754.0	907.8	934.5	1,050.3	1,162.3
Preferred deals	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guaranteed	-	-	0.0	0.0	0.0	0.0	0.0	98.4	110.6	122.3

Top five buy side technology in market

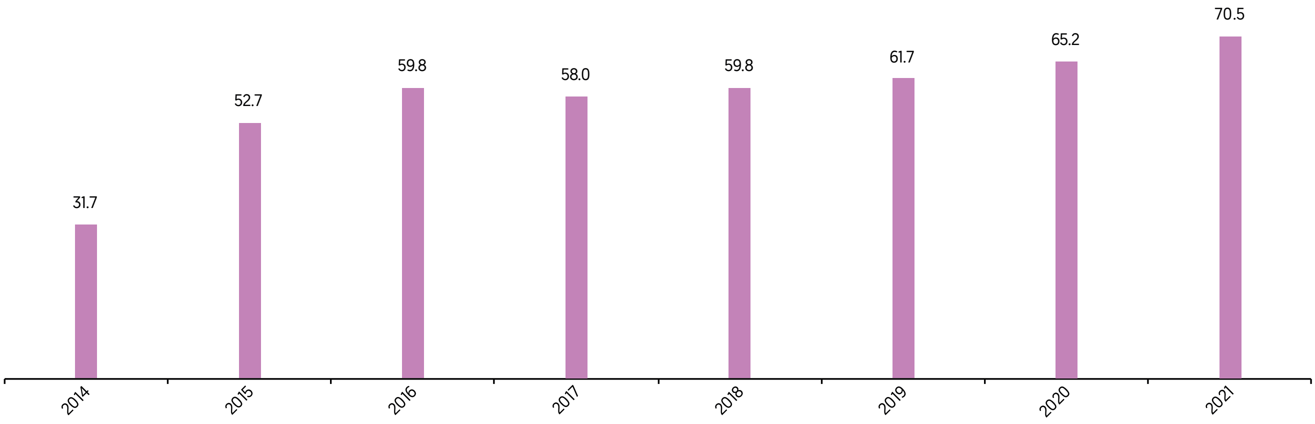
1	DV360
2	Amazon AAP
3	The Trade Desk
4	Amobee
5	mediamath

Top five sell side vendors in market

1	Doubleclick Ad Exchange
2	Rubicon
3	AppNexus
4	OpenX
5	Index Exchange

Source: Zenith, eMarketer, think TV, IAB Internet Revenue Report 2017

Programmatic share of display advertising spend (%)



Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	12.00	12.24
Display	-	-	-	-	-	10.00	10.20
Mobile	-	-	-	-	-	14.00	14.28
Video	-	-	-	-	-	18.00	18.36
Social	-	-	-	-	-	6.00	6.12

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	7.00	7.14
Display	-	-	-	-	-	2.39	2.53
Mobile	-	-	-	-	-	-	-
Video	-	-	-	-	-	2.03	4.52
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	0.09	0.11
Display	-	-	-	-	-	-	-
Mobile	-	-	-	-	-	-	-
Video	-	-	-	-	-	0.21	0.17
Social	-	-	-	-	-	-	-

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	70.0	80.0

Source: Zenith estimates

Adoption of programmatic is high in Canada; all major advertisers and agencies use a variety of programmatic solutions to deliver media to the marketplace. There is competition between adoption of certain ad stacks in the market, primarily between Google and Adobe.

Continually demystifying the negative perception of programmatic ads and the risks involved (for example, brand safety and offensive content) has driven growth, and there has been an increase in executional talent. The Canadian programmatic market will continue to grow past 2021.

The trend within the Canadian market is shifting from managed service buys to more hands-on-keyboard execution. As agencies and clients become more proficient at the execution of programmatic digital, the need for managed services diminishes.

The programmatic offerings of all major publishers have grown over the last year, and this will continue.

Private marketplace deals are most common in Canada, but programmatic guaranteed deals are becoming more prevalent as there is a lack of quality inventory available through auction, especially within programmatic video.

Increased demand for inventory, along with the expansion and development of technology, will lead to increased staffing. Lack of programmatic inventory, again especially within video, will hopefully drive publishers to grow their offerings.

With the exception of out-of-home, there are no true programmatic opportunities in traditional media currently within our market. While traditional broadcasters are attempting to put forth programming offerings for TV, this remains in the early testing phases and we do not expect to see a finished product any time before 2021.

Forecasts

Advertising spend (RMB mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	75,290.9	110,000.0	154,000.0	209,440.0	263,894.4	306,117.5	348,479.2	379,279.2	405,215.7	428,873.8
Total display	37,871.3	49,060.0	70,070.0	102,625.6	133,530.6	165,915.7	201,072.5	222,636.9	240,698.1	256,895.4
Banners + other traditional display	*26,125.9*	*31,460.0*	*38,346.0*	*46,076.8*	*41,959.2*	*35,815.7*	*33,454.0*	*35,652.2*	*36,064.2*	*35,167.7*
Video	*4,818.6*	*7,810.0*	*12,320.0*	*17,174.1*	*32,459.0*	*35,815.7*	*38,332.7*	*40,962.1*	*42,142.4*	*44,174.0*
Native	*6,926.8*	*9,790.0*	*19,404.0*	*39,374.7*	*59,112.3*	*94,284.2*	*129,285.8*	*146,022.5*	*162,491.5*	*177,553.7*

Programmatic spend (RMB mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	550.0	1,530.0	4,840.0	11,510.0	20,530.0	33,230.0	49,210.0	67,090.0	87,217.0	105,417.1
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (RMB mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	550.0	1,439.7	3,208.9	7,504.5	10,778.3	13,358.5	17,174.3	19,724.5	21,696.9	20,822.8
Non-RTB	0.0	90.3	1,631.1	4,005.5	9,751.8	19,871.5	32,035.7	47,365.5	65,520.1	84,594.3

Top five buy side technology in market

1 Tencent DSP
2 Alibaba DSP
3 Baidu DSP
4 Yoyi
5 iPinyou

Top five sell side vendors in market

1 Tencent
2 Alibaba
3 iQiyi
4 Jinritoutiao
5 Google

Source: China Programmatic Market Forecast, iResearch, 2017

Programmatic share of display advertising spend (%)

RTB used to be the main type of deal, but its market share is decreasing and non-RTB is expected to account for almost 69% of programmatic spend at the end of 2019. PMPs are growing because of their transparent resources and high efficiency. PDB is changing, and the biggest change has been the popularity of feed ads. PDB 1.0 was mainly about OTV inventory, whereas now feed ads and OTV inventory are working together.

The market is now moving from DMPs to PMPs, although this shift remains in the early stages. Some advertisers have been building their own (in-house) DMPs via third parties or agencies.

Programmatic development in PC and mobile is saturated, OTT (smart TVs, connected to internet devices) and OOH is the next trend. The technology is mature and can be applied to new media - some OTT programmatic has been developed. However, legislation and supervision set many limits. Also, the monitoring system has not been set up yet for OTT and OOH.

There are still hurdles to in programmatic to overcome. Advertisers still have doubts about the quality of digital ads, and ad verification is not as used in the Chinese market as in others (the GIVT definition for invalid traffic has been well accepted, but not SIVT). Therefore, they have concerns about existing data traffic fraud and worry about context safety. Thus, they have become stricter about ad monitoring and KPI measurement. On the other hand, advertisers want to raise awareness and reach mass audiences instead of just focusing on pinpointing targets. They prefer optimizing their media mix than concentrating on just one type.

DSPs in China are relatively unsophisticated and sometimes not particularly user-friendly. This is a result of the market's legacy of service-based solutions, meaning quite a few of the optimization levers that may be common in western DSPs are not available in Chinese DSPs in the same way. (Some levers might be available internally to DSPs but not as platform features to users.)

Forecasts

Advertising spend (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	49.2	65.4	77.5	114.7	136.7	167.9	208.1	241.4	263.2	282.1
Total display	29.1	34.4	37.5	36.8	41.4	114.3	142.2	165.2	180.2	193.3
Banners + other traditional display	-	-	-	-	-	*77.7*	*97.1*	*113.5*	*123.3*	*132.4*
Video	-	-	-	-	-	*25.1*	*32.1*	*38.3*	*42.3*	*45.8*
Native	-	-	-	-	-	*11.4*	*12.9*	*13.4*	*14.6*	*15.1*

Programmatic spend (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	-	2.2	5.4	6.6	8.3	10.5	13.1
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Top five buy side technology in market

1. DV360
2. Mediamath
3. Appnexus
4. Sonata
5. Centro

Top five sell side vendors in market

1. Google
2. Facebook
3. Eltiempo
4. RCN
5. Caracol

Source: IAB Colombia, eMarketer, Zenith

Programmatic spend - emerging media channels (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Newspapers	-	-	-	-	-	-	-	-	-	-
Magazines	-	-	-	-	-	-	-	-	-	-
TV	-	-	-	-	-	-	-	-	-	-
Radio	-	-	-	-	-	-	1.4	1.5	1.7	2.1
Cinema	-	-	-	-	-	-	-	-	-	-
Out-of-home	-	-	-	-	-	-	-	-	-	-

Source: Zenith estimates

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012*	2013*	2014	2015	2016	2017	2018
Overall	9.75	9.21	7.80	7.47	6.10	4.93	4.21
Display	6.00	5.40	4.77	4.41	3.35	3.53	2.53
Mobile	10.00	9.98	8.72	8.10	6.67	3.99	3.42
Video	20.00	18.95	15.20	15.18	12.62	11.06	9.95
Social	3.00	2.50	2.34	2.19	1.87	1.35	1.22

Average programmatic CPC by media channel (US$)

	2012*	2013*	2014	2015	2016	2017	2018
Overall	0.83	0.64	0.53	0.51	0.45	0.40	0.35
Display	0.52	0.41	0.36	0.30	0.23	0.24	0.22
Mobile	0.45	0.26	0.20	0.18	0.15	0.09	0.07
Video	2.28	1.91	1.53	1.53	1.37	1.25	1.12
Social	0.08	0.07	0.06	0.06	0.05	0.03	0.02

Average programmatic CTR by media channel (%)

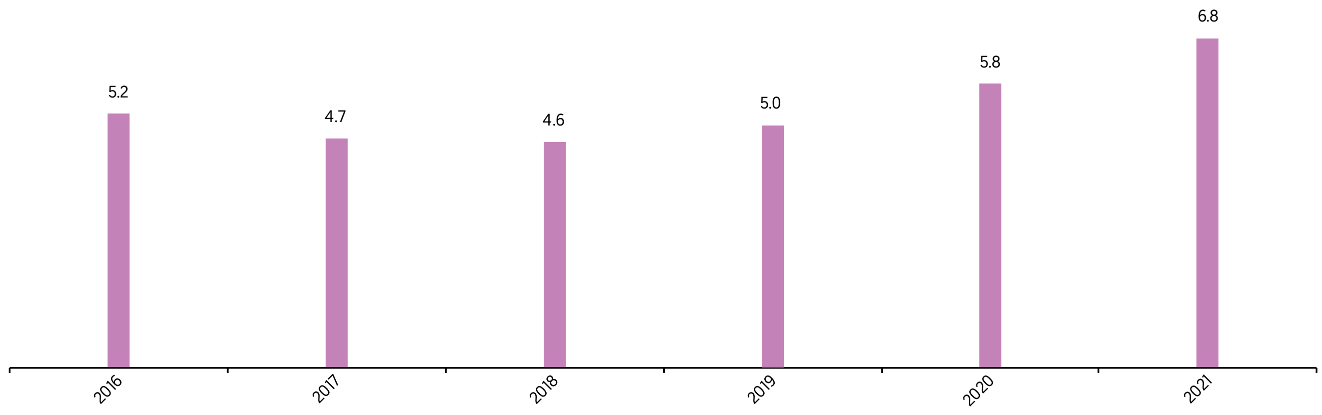
	2012*	2013*	2014	2015	2016	2017	2018
Overall	0.44	0.45	0.47	0.64	0.69	0.76	0.94
Display	0.10	0.11	0.13	0.16	0.19	0.22	0.28
Mobile	0.14	0.22	0.38	0.57	0.61	0.72	0.78
Video	0.80	0.83	0.77	0.92	0.96	1.01	1.41
Social	0.72	0.78	0.60	0.94	1.02	1.12	1.32

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	52.0	57.0	63.0	68.0	70.0	71.0	72.0

Source: Zenith estimates

Programmatic share of display advertising spend (%)



Programmatic has seen fast growth. Ad networks, publishers and other media companies see increasing competition from different sites and apps that were completely overlooked by traditional media purchase and now have the possibility to offer their inventory through the ad exchanges.

Even though some clients are still reluctant to invest in programmatic, the relevance of DMPs is increasing as they provide an even deeper understanding of consumers, when combined with both first and second party data. Nevertheless, the digital landscape in Colombia is still pretty small compared to other markets'; finding talented people with the requisite expertise can be difficult.

Managed service is commonplace.

Most buying is done on the open market, but PMPs are common. Preferred deals and private auction deals are the most common private marketplaces for premium inventory purchase, and we are expanding our use of these. Guaranteed continues to gain relevance in top sizes and rich interactive formats.

We have started to buy audio on digital radio programmatically, and are planning to start implementing OOH integrations as well. Expectations are high as this is a growing trend in several Latin American markets, and we think this will expand over the next two years.

The main barrier to programmatic in this market is that clients still see it as a single solution; many still don't understand the full capabilities that programmatic advertising can offer them, and are reluctant to run campaigns targeted at the lower conversion funnel.

Croatia

The programmatic environment in Croatia is still underdeveloped. Although there is a lot of talk about it investment is still quite low, and a large number of agencies are still 'testing' it without any significant budgets behind those tests.

Measurement of digital spend in the Croatian market is misleading, so all data regarding actual digital spend in our market is based solely on our estimations. We think that programmatic spend currently accounts for between 8% and 15% of display buys, equivalent to less than €1.8 million. Programmatic is growing, but extremely slowly.

There is a high 'fear' factor amongst all parties involved in the programmatic ecosystem: local publishers are quite reluctant to give up their best inventory due to fear of losing control over the buying process, as well as a decrease in revenues; and clients don't like the additional expenses that come with using programmatic platforms, along with fear of ad fraud and brand safety issues regarding ad positioning alongside problematic and irrelevant content. Agencies, on the other side, are afraid of losing additional revenue from direct publishers, and they lack people with skills to handle these programmatic platforms.

Due to this fragmented, overprotective market, global platforms are reluctant to approach and educate the market, which then prolongs this situation.

Czech Republic

Forecasts

Advertising spend (CZK mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	5,716.2	6,035.1	6,700.9	7,196.3	8,493.1	9,919.3	11,516.7	12,373.7	13,231.6	14,033.3
Total display	2,844.8	3,133.3	3,340.0	3,540.0	3,830.0	4,062.0	4,980.0	5,320.7	5,689.6	6,034.3
Banners + other traditional display	*2,235.2*	*2,425.8*	*2,530.3*	*2,528.6*	*2,721.3*	-	-	-	-	-
Video	*609.6*	*707.5*	*809.7*	*1,011.4*	*1,108.7*	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (CZK mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	200.0	527.0	886.0	1,246.0	1,495.2	1,644.5	1,809.0
Banners + other traditional display	-	-	-	*170.0*	*421.6*	*673.4*	*897.1*	*1,068.0*	*1,118.3*	*1,121.5*
Video	-	-	-	*30.0*	*100.1*	*194.9*	*311.5*	*381.4*	*444.0*	*542.7*
Native	-	-	-	*0.0*	*5.3*	*17.7*	*37.4*	*45.8*	*82.2*	*144.7*

Programmatic spend by type of deal (CZK mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	-	120.0	369.0	611.0	872.0	1,046.4	1,151.5	1,266.3
Private marketplaces	-	-	-	60.0	111.0	193.0	250.0	300.0	329.0	361.8
Preferred deals	-	-	-	20.0	47.0	82.0	124.0	148.8	164.5	180.9
Guaranteed	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Top five buy side technology in market

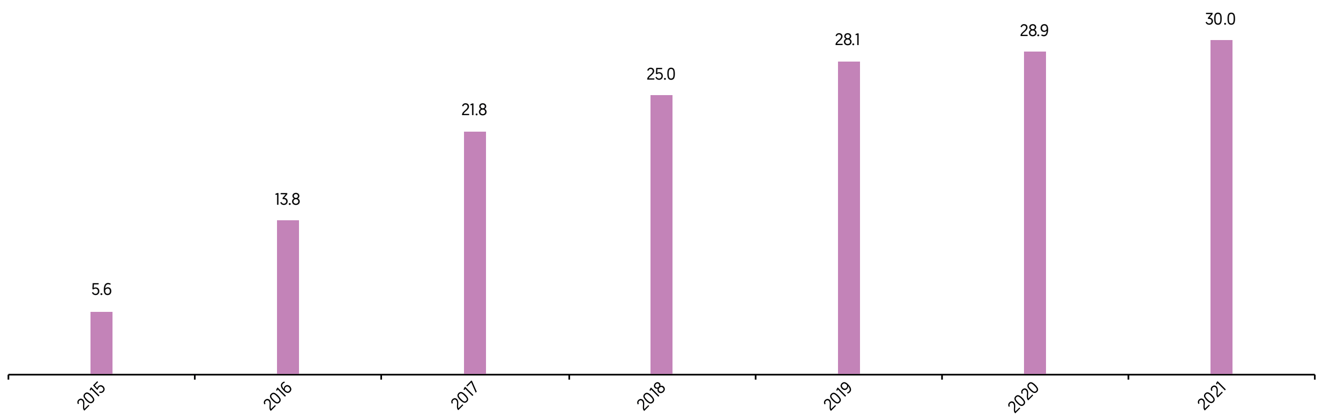
1	Adform
2	Display Video 360
3	Appnexus
4	Media Math
5	Sklik

Top five sell side vendors in market

1	Google
2	Rubicon
3	Apnexus
4	Adform
5	iBB

Source: spir.cz, Adform MIA, DV360

Programmatic share of display advertising spend (%)



The programmatic market in the Czech Republic is reaching maturity. The main DSPs are Adform and Google Marketing Platform, although Google has a much smaller share of the market. The most common DMPs used by agencies and the biggest data providers are Audience Base by Adform full-stack and Adobe Audience Manager.

Open RTB constitutes the most used buying model (69%), ahead of PMP (20%), preferred deals (11%) and almost non-existent guaranteed. The market leans towards self-service in terms of biddable media. Education around programmatic is being led mainly by the agencies and the leading publisher Seznam.

The main drivers of growth in 2020 will be increased interest in DMP options available, like combining the additional reach and frequency targeting and research panel cooperation, as well as increasing demand for high performing CRM segmented audiences and guaranteed brand safety.

A few traditional media channels, such as connected TV, audio and digital OOH, are also accessible programmatically, but at very high CPTs with unreasonable impression volumes and low reach availability.

Denmark

Forecasts

Advertising spend (DKK mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	4,543.0	4,924.0	5,458.0	6,138.0	6,719.0	7,357.0	8,060.0	8,422.3	9,180.3	10,190.1
Total display	1,447.0	1,566.0	1,794.0	2,005.9	2,202.0	2,490.0	2,748.0	2,871.5	3,130.0	3,474.3
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (DKK mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	0.0	592.0	1,003.0	1,321.2	1,743.0	2,061.0	2,158.8	2,567.0	3,108.4
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (DKK mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	438.1	702.1	924.8	1,220.1	1,339.7	1,174.0	1,266.6	1,365.5
Private marketplaces	-	-	153.9	200.6	264.2	348.6	412.2	139.3	0.0	0.0
Preferred deals	-	-	0.0	100.3	132.1	174.3	206.1	473.4	563.0	738.5
Guaranteed	-	-	0.0	0.0	0.0	0.0	103.1	372.0	737.3	1,004.4

Top buy side technology in market

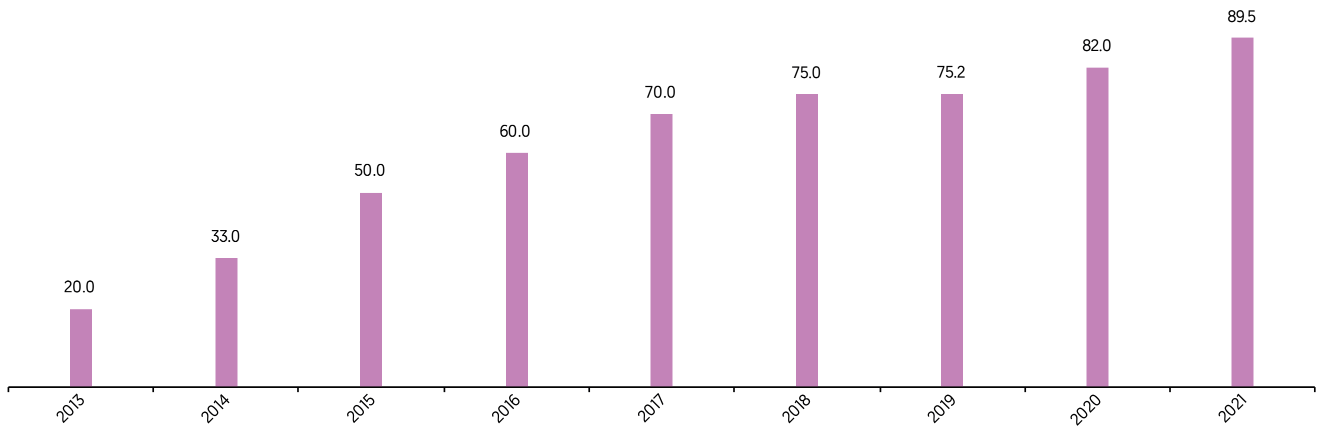
1. Google Display & Video 360
2. AppNexus
3. Adform
4. Mediamath

Top five sell side technology in market

1. Google Ad Manager
2. Adform
3. Pubmatic
4. AppNexus
5. Freewheel

Source: Adform, Google, Zenith

Programmatic share of display advertising spend (%)



Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	11.55	0.19	7.59	6.25	6.15	4.36
Display	-	11.55	0.19	-	-	5.74	4.08
Mobile	-	11.55	-	-	-	7.35	3.45
Video	-	37.11	-	-	-	16.28	15.94
Social	-	-	-	-	-	-	6.66

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	37.11	0.00	2.40	3.87	7.28	3.39
Display	-	37.11	0.00	-	-	10.01	5.90
Mobile	-	37.11	-	-	-	5.46	2.90
Video	-	-	-	-	-	2.06	3.69
Social	-	-	-	-	-	-	1.19

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	0.03	50.00	0.32	0.16	0.08	0.12
Display	-	0.03	50.00	-	-	0.06	0.07
Mobile	-	0.03	-	-	-	0.13	0.12
Video	-	0.03	-	-	-	0.79	0.47
Social	-	-	-	-	-	-	1.57

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	65.5	51.4

Source: Zenith estimates

The programmatic market in Denmark is increasing year on year and we estimate that 75% of digital display spend in 2019 will be allocated to programmatic. As the market continues to grow, publishers continue to develop and tap into the use of data. The appetite for knowledge around programmatic continues to be very high, but the current knowledge levels vary a lot. In agencies, it is very good, but some clients still lack knowledge of how to extract real value from programmatic.

There are various DSPs (Demand Side Platforms) accessible in the market, primarily US-based firms such as AppNexus, Google Display & Video 360, and Mediamath. Nordic-based DSP providers include Adform and Delta Projects, which still have a strong hold on a lot of legacy accounts. Most agencies in Denmark have a multiple-DSP approach. There is also an increasing interest in and use of data, both from third-party providers and companies that own first-party data.

The DSPs offering a managed service are losing business, as advertisers and agencies establish their own in-house trading desks.

Currently the most common deals are open deals, but preferred and guaranteed are growing.

Linear TV has not yet been offered programmatically, and is not expected to be in the near future. Programmatic audio is becoming more widely used.

Ecuador

Forecasts

Advertising spend (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	5.6	7.4	20.0	20.1	28.4	31.1	50.7	60.9	73.1	87.7
Total display	1.8	5.5	14.0	14.3	21.3	23.5	41.2	50.7	60.8	74.0
Banners + other traditional display	*1.6*	*4.9*	*12.3*	*12.1*	*17.4*	*13.0*	*12.4*	*12.7*	*15.2*	*18.5*
Video	*0.1*	*0.3*	*0.9*	*1.1*	*2.2*	*8.3*	*20.6*	*27.9*	*36.5*	*44.4*
Native	*0.1*	*0.3*	*0.8*	*1.0*	*1.8*	*2.2*	*8.2*	*10.1*	*9.1*	*11.1*

Programmatic spend (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	0.6	1.5	6.0	8.0	8.6	9.7	11.1	11.4	13.7	16.7
Banners + other traditional display	*0.6*	*1.4*	*5.7*	*7.6*	*7.9*	*6.3*	*10.0*	*10.3*	*12.3*	*15.0*
Video	-	-	*0.3*	*0.5*	*0.7*	*3.4*	*0.6*	*0.6*	*0.7*	*0.8*
Native	-	-	-	-	-	-	*0.6*	*0.6*	*0.7*	*0.8*

Programmatic spend by type of deal (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	0.6	1.5	6.0	8.0	8.6	9.7	11.1	11.4	13.7	16.7
Private marketplaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preferred deals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guaranteed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Top buy side technology in market

1. Brickthunder- Basos DSP

Top sell side vendors in market

1. Brickthunder
2. Media Interactiva
3. Doubleclick

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	3.00	3.30
Display	-	-	-	-	-	2.84	3.18
Mobile	-	-	-	-	-	2.56	2.89
Video	-	-	-	-	-	4.03	4.59
Social	-	-	-	-	-	2.45	2.57

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	0.55	0.56
Display	-	-	-	-	-	0.37	0.45
Mobile	-	-	-	-	-	0.27	0.28
Video	-	-	-	-	-	0.45	0.45
Social	-	-	-	-	-	0.25	0.26

Average programmatic CTR by media channel (%)

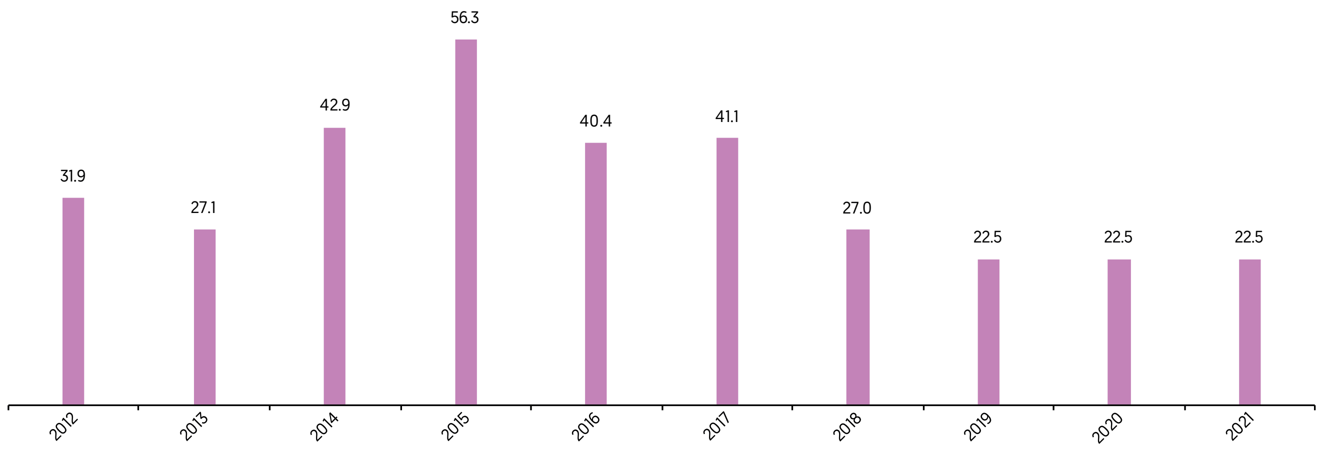
	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	0.20	0.20
Display	-	-	-	-	-	0.19	0.19
Mobile	-	-	-	-	-	0.22	0.22
Video	-	-	-	-	-	0.15	0.15
Social	-	-	-	-	-	0.30	0.30

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	0.6	0.6

Source: Zenith estimates

Programmatic share of display advertising spend (%)



Programmatic has been growing fast, and the main programmatic technologies used in Ecuador are DSPs, DMPs and exchanges. There is strong competition in the market because there are many suppliers competing on price and there is no differentiation between the offers of the platforms. Self-service is standard.

Over the past four years, agencies and advertisers have learned more about programmatic trading, and publishers are more open to putting inventory on the market, although still only up to around 45%, with the rest remaining direct sale. Currently, all programmatic trading is open-market RTB.

We are starting to see programmatic being used with radio for some international radio stations that stream online.

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	12.0	13.3	15.8	23.2	25.7	29.0	33.0	36.0	39.0	41.0
Total display	11.6	12.1	13.6	19.5	20.3	23.5	26.2	28.0	31.0	34.8
Banners + other traditional display	*11.3*	*11.7*	*12.9*	*18.1*	*18.4*	*20.0*	*22.0*	*23.0*	*25.0*	*28.0*
Video	*0.2*	*0.4*	*0.7*	*1.2*	*1.4*	*2.8*	*3.4*	*4.2*	*5.2*	*6.0*
Native				*0.2*	*0.5*	*0.8*	*0.8*	*0.8*	*0.8*	*0.8*

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	0.1	0.1	0.3	3.2	4.9	10.2	11.0	12.0	13.0	14.0
Banners + other traditional display	*0.1*	*0.1*	*0.3*	*3.0*	*4.4*	*8.5*	*8.8*	*9.1*	*9.2*	*10.0*
Video	-	-	-	*0.2*	*0.5*	*1.7*	*2.2*	*2.9*	*3.8*	*4.0*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	0.1	0.1	0.3	3.2	4.9	10.2	11.0	12.0	13.0	13.5
Private marketplaces	-	-	-	-	-	-	-	-	-	0.5
Preferred deals	-	-	-	-	-	-	-	-	-	-
Guaranteed	-	-	-	-	-	-	-	-	-	-

Top buy side technology in market

1. Adform
2. DoubleClick Bid Manager
3. Ad.Target.Me
4. Google ad exchange

Top sell side vendors in market

1. Google ad exchange
2. Adform

Source: TNS Emor AdEx survey, Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	0.98	1.75	1.44
Display	-	-	-	-	0.51	0.57	0.53
Mobile	-	-	-	-	0.77	0.84	0.69
Video	-	-	-	-	5.07	4.80	3.33
Social	-	-	-	-	0.54	1.29	1.75

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	0.19	0.21	0.24
Display	-	-	-	-	0.17	0.29	0.29
Mobile	-	-	-	-	0.17	0.24	0.25
Video	-	-	-	-	5.24	2.17	2.15
Social	-	-	-	-	0.29	0.29	0.52

Average programmatic CTR by media channel (%)

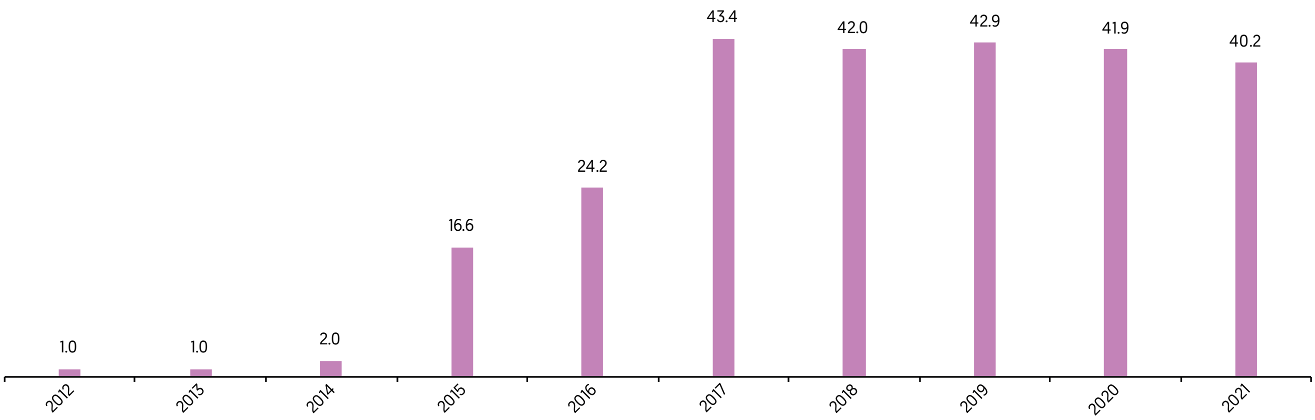
	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	0.50	0.84	0.61
Display	-	-	-	-	0.30	0.20	0.18
Mobile	-	-	-	-	0.46	0.35	0.28
Video	-	-	-	-	0.10	0.22	0.15
Social	-	-	-	-	0.19	0.45	0.34

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	24.9	37.4	50.5

Source: Zenith estimates

Programmatic share of display advertising spend (%)



The principal sell-side vendors are Google ad exchange and AdForm. Sizmek, Crimtan and others have tried to enter the market, but so far unsuccessfully. Programmatic's share of the market is relatively modest and growth is fairly slow. Some local portals have tried to sell their inventory programmatically and failed to do so. This is because there are only a few local portals that see heavy traffic, and direct buying enables advertisers to use more engaging formats.

Local publishers have the opportunity to sell premium formats, which do not interrupt the consumer, at three to four times the price of more general formats. Local publishers can deliver fast reach and this gives them an advantage. The quality of segments and targeting still needs to develop further for advertisers to commit increased budgets. Over-targeting in a small market could be very harmful for advertisers.

Many marketers use programmatic as a supportive channel and to test the opportunities available. CPM buying is still the most common type of deal, although the rise of e-commerce is bringing about more and more CPC buying.

Finland

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	222.4	237.7	242.0	285.9	324.0	370.0	419.0	444.1	486.2	530.4
Total display	141.0	152.0	114.0	153.0	188.0	222.0	259.0	275.4	306.3	339.5
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	14.1	15.2	17.1	38.3	56.4	77.7	124.3	151.5	199.1	220.6
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Top five buy side technology in market

1. Adform
2. Google DV360
3. Mediamath
4. AppNexus
5. Xaxis

Top sell side vendors in market

1. AppNexus
2. Adform
3. Google Ad Manager
4. Freewheel SSP
5. Pubmatic

Source: Zenith estimates

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	12.40	11.50
Display	-	-	-	-	-	6.40	4.40
Mobile	-	-	-	-	-	12.00	11.00
Video	-	-	-	-	-	18.40	18.60
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	2.10	1.85
Display	-	-	-	-	-	3.05	2.00
Mobile	-	-	-	-	-	2.27	1.30
Video	-	-	-	-	-	1.21	1.70
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	0.58	0.59
Display	-	-	-	-	-	0.15	0.16
Mobile	-	-	-	-	-	0.99	1.30
Video	-	-	-	-	-	1.00	1.10
Social	-	-	-	-	-	-	-

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	95.0	95.0

Source: Zenith estimates

Programmatic share of display advertising spend (%)

The main DSPs in the Finnish market are Google Marketing Platform and Adform. Also operating are Mediamath, Xaxis and AppNexus, although they constitute a much smaller share of the market. AppNexus is the dominant SSP, while Adform and Google have some share.

Growth is slowing, but we expect it to remain in double-digits over the next few years.

Programmatic is slowly killing all the direct publisher reservations of display/video and ad networks. Most advertisers are using self-service platforms, which are run by agencies. Generally, the level of knowledge of programmatic trading is good in Finland. Most of the education has been done by the agencies and the IAB.

In the Finnish market, the most commonly placed deals are private deals, private marketplaces and open auction.

For publishers, the three key drivers are video inventory, viewability and mobile app inventory. Indeed, the biggest challenge at the moment is the lack of video inventory in premium media and in in-stream services.

All radio and out-of-home publishers are testing programmatic opportunities in very small scale, but the goal is to transform all digital OOH to be bought programmatically. Programmatic TV is challenged by current broadcast technologies, but all TV channels are interested in trying a pilot.

France

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	2,551.0	2,643.0	2,911.0	3,076.0	3,322.8	3,753.9	4,521.3	5,108.7	5,681.5	6,237.2
Total display	738.0	753.0	958.0	1,051.0	1,203.8	1,450.4	1,974.0	2,314.8	2,643.4	2,962.3
Banners + other traditional display	*636.0*	*617.0*	*728.0*	*742.0*	*786.8*	*873.7*	*1,127.0*	*1,230.7*	*1,331.6*	*1,427.5*
Video	*102.0*	*136.0*	*230.0*	*309.0*	*417.0*	*576.7*	*847.0*	*1,084.2*	*1,311.8*	*1,534.8*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	52.0	117.0	263.0	423.0	639.0	901.0	1,315.0	1,710.0	2,120.0	2,480.0
Banners + other traditional display	*52.0*	*101.0*	*208.0*	*314.0*	*448.0*	*555.0*	*691.0*	*880.1*	*1,074.3*	*1,214.7*
Video	-	*16.0*	*55.0*	*109.0*	*191.0*	*346.0*	*624.0*	*829.9*	*1,045.7*	*1,265.3*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (€mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	44.2	87.8	160.4	203.0	249.2	280.7	341.9	427.5	508.8	570.4
Private marketplaces	6.2	17.6	47.3	93.1	127.8	153.9	210.4	290.7	381.6	471.2
Preferred deals	1.6	11.7	52.6	114.2	236.4	425.6	710.1	932.0	1,166.0	1,376.4
Guaranteed	0.0	0.0	2.6	12.7	25.6	40.7	52.6	59.9	63.6	62.0

Top five buy side technology in market

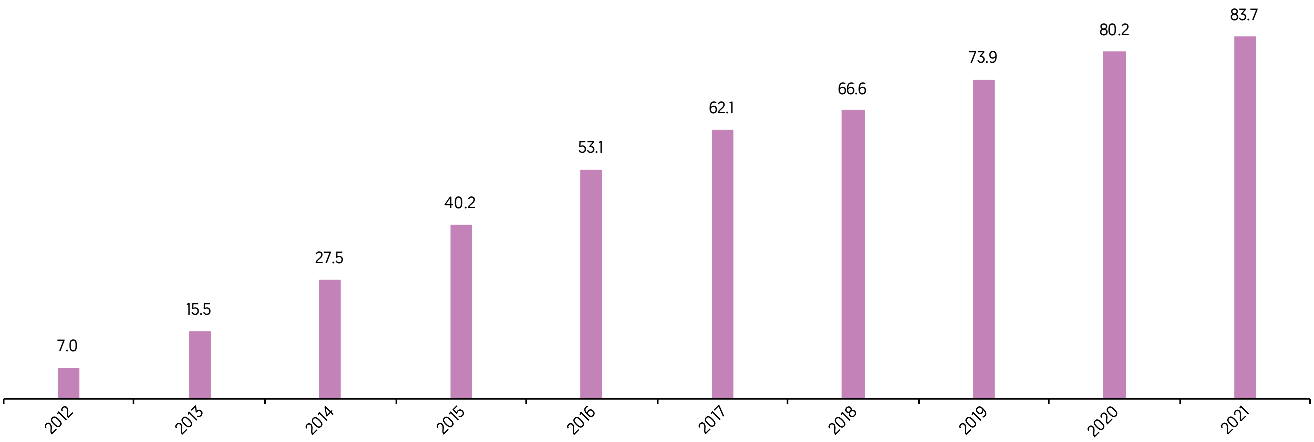
1	DV360
2	AppNexus
3	Amazon AdV. Platform
4	Trade Desk
5	Adobe/Tube Mogul

Top five sell side vendors in market

1	Google Adexchange
2	AppNexus
3	Freewheel
4	Smart RTB+
5	Rubicon

Source: Observatoire de l'e-pub SRI, Udecam, Publicis Media

Programmatic share of display advertising spend (%)



Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	1.45	1.99	2.25	2.50	4.14	5.66	5.13
Display	1.03	1.07	1.27	1.27	2.15	2.73	2.22
Mobile	1.03	1.07	0.00	4.30	11.93	6.74	13.02
Video	1.41	1.64	8.81	7.70	9.88	10.33	9.98
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	1.16	1.08	1.29	1.16	1.59	1.31	0.89
Display	1.41	1.64	2.07	1.29	1.19	0.71	0.33
Mobile	1.41	1.64	0.00	0.32	1.83	0.72	2.33
Video	0.84	0.82	0.95	1.12	2.00	2.06	2.46
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.13	0.18	0.17	0.22	0.26	0.43	0.58
Display	0.07	0.07	0.06	0.10	0.18	0.39	0.68
Mobile	0.07	0.07	0.00	1.35	0.65	0.94	0.56
Video	0.07	0.07	0.93	0.69	0.49	0.50	0.41
Social	-	-	-	-	-	-	-

Nearly all publishers have adopted programmatic trading in France. The strong growth of programmatic means it constituted 67% of display spend in 2018 (up from 62% in 2017), representing 46% growth in spend overall. This growth is being driven by formats such as IPTV, video, native ads, mobile and, above all, social ads. It is also being helped along by the spread of ad verification and transparency solutions.

In terms of knowledge, we need to maintain efforts to educate the market in this ever-changing environment, on both the technological and regulatory fronts. It must be a collective effort.

Managed DSP services have almost disappeared because of the lack of transparency. There are new players around data, which are changing their model from data providers to managed service: Gravity, Carrefour Media, and 3W relevanC.

Preferred deals constitute the most used buying model (54% in 2018), ahead of open RTB (26%), private marketplaces (16%) and guaranteed (4%). The market is now mature and this percentage split is quite steady.

Publishers now sell their inventories directly to bypass the ad networks. Technology is now a major asset for them.

Demand is strong for premium inventories and header-bidding technology contributes to revenue growth for publishers. Publishers have launched the Digital Ad Trust to reassure advertisers over the problems of brand safety and fraud.

One of the main barriers still is the transparency of the value chain, but industry bodies are working with the IAB tech lab to develop a trust ID that allows publishers/SSP's to identify advertisers' campaigns and show transparency from the intermediaries.

Addressable TV should be authorized in France for live TV at the beginning of 2020, except for campaigns with a local address (in order not to compete with other local media). It will be experimental for the first two years, to give it time to implement technology, to advance on audience measurement and to equip households and create market standards.

Currently, addressable TV is allowed on OTT (adstitching) but is not very well developed yet except for big sport events or for news channels.

JCDecaux and Clear Channel sell some of their digital outdoor inventory programmatically, but it is not a priority for them at the moment. Meanwhile, programmatic is available on digital radio from NRJ, Spotify, Deezer and Target spot.

Georgia

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	-	0.55
Display	-	-	-	-	-	-	0.30
Mobile	-	-	-	-	-	-	0.30
Video	-	-	-	-	-	-	1.50
Social*	-	-	-	-	-	-	0.60

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	-	0.10
Display	-	-	-	-	-	-	0.10
Mobile	-	-	-	-	-	-	0.05
Video	-	-	-	-	-	-	0.25
Social*	-	-	-	-	-	-	0.07

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	-	0.50
Display	-	-	-	-	-	-	0.30
Mobile	-	-	-	-	-	-	0.65
Video	-	-	-	-	-	-	0.40
Social*	-	-	-	-	-	-	0.50

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	-	60.00

Source: Zenith estimates

Programmatic trading is still in a very early stage in Georgia. Brands and agencies need a lot of education about its benefits.

Eskimi DSP has a strong presence in Georgia, and also owns a DMP to provide advanced targeting. There are more than 45 ad exchanges.

Germany

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	3,749.2	4,150.0	5,282.0	5,804.0	6,367.0	6,791.0	7,433.0	7,908.7	8,520.8	9,141.2
Total display	1,187.0	1,461.0	1,644.0	1,875.0	2,304.0	2,667.0	2,730.0	3,081.3	3,356.3	3,631.4
Banners + other traditional display	*1,071.0*	*1,310.0*	*1,392.7*	*1,505.5*	*1,679.6*	*1,757.0*	*1,609.1*	*1,478.6*	*1,209.4*	*891.2*
Video	*116.0*	*151.0*	*202.0*	*257.0*	*394.0*	*510.0*	*493.0*	*555.0*	*603.0*	*634.0*
Native	-	-	*49.3*	*112.5*	*230.4*	*400.1*	*627.9*	*1,047.6*	*1,543.9*	*2,106.2*

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	279.5	431.3	737.3	1,093.5	1,365.0	1,941.2	2,461.3	3,062.4
Banners + other traditional display	-	-	-	-	*560.3*	*721.7*	*805.4*	*912.4*	*861.5*	*704.4*
Video	-	-	-	-	*103.2*	*207.8*	*259.4*	*368.8*	*467.6*	*581.9*
Native	-	-	-	-	*73.7*	*164.0*	*300.3*	*660.0*	*1,132.2*	*1,776.2*

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	187.3	202.7	339.1	306.2	218.4	174.7	148.0	148.9
Private marketplaces	-	-	83.8	172.5	331.8	623.3	900.9	1,378.3	1,758.1	2,062.9
Preferred deals	-	-	5.6	43.1	44.2	109.3	177.5	291.2	407.1	595.5
Guaranteed	-	-	2.8	12.9	22.1	54.7	68.3	97.1	148.0	255.2

Top five buy side technology in market

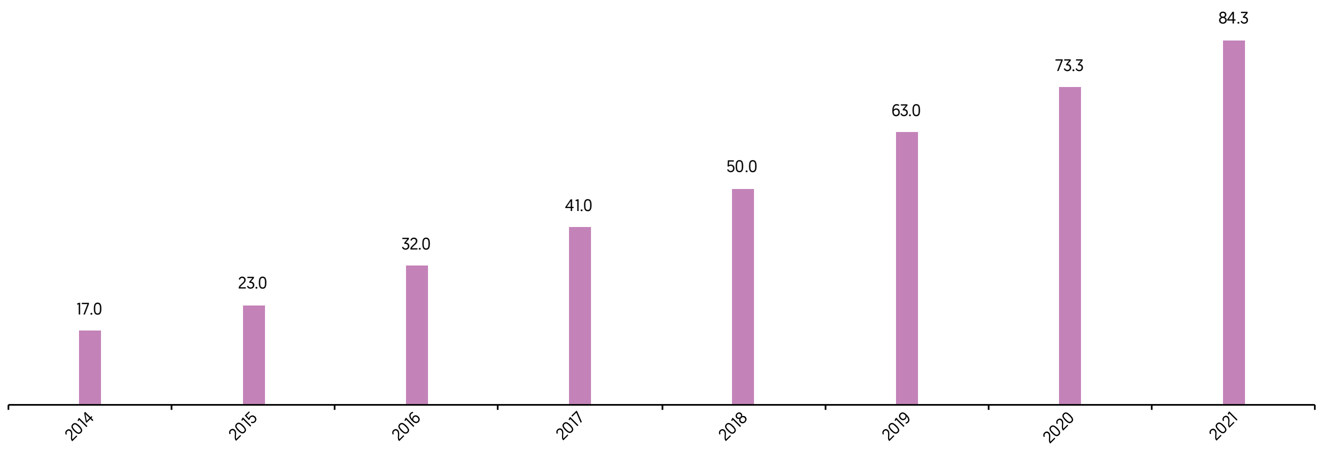
1 The Trade Desk
2 DV 360 (DBM)
3 Active Agent
4 Amazon Advertising Platform
5 Adara

Top five sell side vendors in market

1 Google AdX
2 Yieldlab
3 Smartclip
4 Ströer
5 Appnexus/rubicon

Source: Zenith, DSPs

Programmatic share of display advertising spend (%)



In the last year, the market has come to accept programmatic advertising as a standard part of digital advertising strategies. Most clients understand what programmatic is and what it does, and those who do not are eager to learn more. Knowledge of programmatic has increased significantly compared to just a few years ago. Agencies have their own programmatic teams and specialists who have in-depth knowledge of the market. Global companies are driving programmatic growth, which has in turn driven greater interest for programmatic in the whole market, especially on the client side.

The programmatic landscape has all the major DSPs, SSPs and many local solutions that cater to Germany's specific need for greater data safety. Due to data safety concerns, this part of the market has been very slow to develop. Currently, customers are focusing on these topics: ad verification (brand safety, viewability, and ad fraud), data security (GDPR and data privacy), data management platforms and campaign structure (data-based versus content-based approach).

Programmatic is the preferred buying modality across mobile and desktop devices, with deep penetration in video specifically. We expect programmatic buying to extend to other channels such as OTT, Smart TVs or CTV.

The definition of quality is evolving. Brands are now looking at the combination of viewability, fraud and brand safety as a true measure of value. While they have KPIs across each of these criteria, true media value is focused on the combination of these variables, and the ability to deliver consumer outcomes (engagement, sale, etc.).

The growth in programmatic can be attributed to two main factors: increased understanding of programmatic on the client side has increased the investment they are willing to make in programmatic advertising; and the willingness of publishers to open up the more valuable inventory, such as online video, has increased the potential budgets that can be invested in programmatic advertising.

The most common deals used are private deals, followed by preferred deals: both of them are continuously growing - private deals more rapidly, preferred deals at a moderate level. Furthermore, guaranteed deals, especially for video campaigns, have increased due to better predictability, availability and quality of the video environment or content.

Programmatic advertising is well on the way to becoming fully adopted by the market, especially with the channels and technologies available. With the convergence of video and TV, brands are demanding to understand their video campaigns holistically (across linear TV, mobile, desktop and emerging advanced TV channels (CTV, OTT, Smart TVs, streaming services etc.). Audiences are becoming as important as content and context.

Hong Kong

Forecasts

Advertising spend (HK$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	452.0	1,276.0	2,106.0	2,771.2	3,045.0	4,146.0	5,213.0	6,881.2	9,083.1	11,989.7
Total display	452.0	1,276.0	2,106.0	2,771.2	3,045.0	4,146.0	5,213.0	6,881.2	9,083.1	11,989.7
Banners + other traditional display	*437.7*	*1,207.4*	*1,970.1*	*2,527.5*	*2,655.9*	*3,455.0*	*3,664.8*	*4,064.0*	*4,941.2*	*6,021.3*
Video	*14.3*	*68.6*	*135.9*	*213.2*	*338.3*	*598.9*	*1,304.0*	*2,466.7*	*3,672.3*	*5,370.1*
Native	-	-	-	*30.4*	*50.8*	*92.1*	*244.2*	*350.5*	*469.6*	*598.3*

Programmatic spend (HK$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	60.5	166.3	365.5	787.7	1,271.3	1,725.6	2,243.3	2,916.3
Banners + other traditional display	-	-	*60.5*	*149.7*	*308.9*	*622.3*	*854.1*	*1,032.6*	*1,222.1*	*1,463.8*
Video	-	-	-	*16.6*	*54.8*	*157.5*	*391.9*	*642.5*	*945.7*	*1,354.3*
Native	-	-	-	-	*1.8*	*7.9*	*25.3*	*50.5*	*75.4*	*98.2*

Programmatic spend by type of deal (HK$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	60.5	166.3	347.2	630.2	864.5	1,107.2	1,342.7	1,585.9
Private marketplaces	-	-	0.0	0.0	18.3	118.2	254.3	198.5	281.8	422.7
Preferred deals	-	-	0.0	0.0	0.0	15.8	89.0	367.1	509.2	743.0
Guaranteed	-	-	0.0	0.0	0.0	23.6	63.6	52.8	109.6	164.7

Top five buy side technology in market

1. Display and Video 360
2. The Trade Desk
3. AppNexus
4. Verizon
5. Adobe Ad Cloud DSP

Top sell side vendors in market

1. Google Ads Manager
2. Rubicon
3. Verizon
4. Ucfunnel

Source: Zenith, IAB

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.80	1.37	2.48	3.05	2.61
Display	-	-	0.87	1.35	1.80	2.35	2.61
Mobile	-	-	0.36	-	1.47	-	-
Video	-	-	0.01	13.33	9.92	11.36	0.37
Social	-	-	-	-	-	-	-

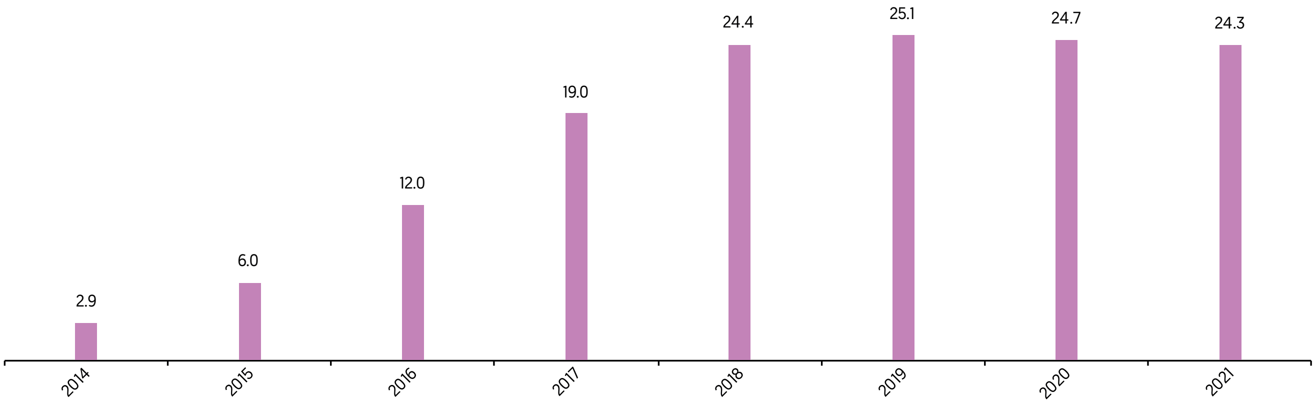
Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	1.00	1.27	1.83	2.31	2.13
Display	-	-	1.26	1.26	1.66	2.59	2.13
Mobile	-	-	0.24	-	0.22	-	-
Video	-	-	-	3.41	4.28	1.82	-
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.08	0.11	0.14	0.13	0.12
Display	-	-	0.07	0.11	0.11	0.09	0.12
Mobile	-	-	0.15	-	0.66	-	-
Video	-	-	-	0.39	0.23	0.63	0.34
Social	-	-	-	-	-	-	-

Programmatic share of display advertising spend (%)



With the rising importance of data driven marketing, the adoption of programmatic technology is growing. Google Campaign Manager is the dominant ad server. Together with the whole stack of the Google Marketing Platform, including Google Analytics 360 for seamless data integration, Display & Video 360 is the most popular DSP in Hong Kong with exclusive YouTube inventory. Having said that, competition between DSPs is fierce, and over 70% of advertisers are currently buying via two or more DSPs. The Trade Desk, AppNexus and Verizon are also popular DSPs in Hong Kong.

The use of DMPs from the buyer side remains stagnant and is mainly driven by global advertisers, but more and more local publishers have started adopting DMPs to provide addressable inventory with their own data for precise targeting.

Publishers realise the importance of data, and therefore are willing to invest in their data infrastructure and DMPs. Some publishers have become open to offering their own data via data exchange as second party data, or are even available on DSPs as third party data providers.

There is a large gap between advertisers that are well informed about programmatic and ad tech, and those that have very limited knowledge. On both sides, however, we see a big appetite for more knowledge. Education is mainly led by industry bodies (for example, the IAB), tech vendors and agencies.

There are three key drivers behind growth in programmatic in Hong Kong. The first is that there is more premium inventory available to be bought via programmatic; this trend started in 2018 among leading local publishers and local ad network players. This also gives branding advertisers more confidence to invest budgets in programmatic. And finally, there is increasing demand for video inventory with audience data.

The main concerns stopping advertisers from further increasing spend on programmatic include issues around brand safety, and the quality of third party data for driving better performance.

The trend between managed-service and self-service is gradually shifting towards self-service, and most agencies run self-service trading desks. However, the use of managed-service buys continues, due to publishers reserving most of their premium inventory and valuable data for managed service only to protect the revenue of their direct sales.

Open exchange is still the most common type of deal used in Hong Kong, but there is an uptrend of preferred deals, which are mostly adopted by publishers for selling their premium inventory. Advertisers also tend to shift budgets from open exchange to different types of PMPs through developing direct relationships with publishers, to ensure brand safety and transparency on pricing.

Programmatic opportunities within traditional media channels remain in the early stages, due to the lack of programmatic technique, especially in TV channels. Programmatic digital OOH has been available in Hong Kong for two years, but the demand is limited as there is no key differentiation between self-service and managed service.

Hungary

Forecasts

Advertising spend (HUF mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	32,078.0	40,332.0	48,188.0	54,831.0	67,145.0	78,257.0	89,300.0	99,918.0	109,582.8	119,268.7
Total display	15,028.0	18,149.0	20,962.0	23,243.0	28,967.0	34,196.0	39,100.0	43,792.0	48,171.2	52,506.6
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (HUF mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	85.0	580.0	1,028.0	1,822.0	2,701.0	3,916.5	5,483.0	7,458.9
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (HUF mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	85.0	513.0	944.0	1,708.0	2,593.0	3,642.3	5,099.2	7,084.1
Private marketplaces	-	-	0.0	67.0	84.0	114.0	108.0	274.2	383.8	372.8
Preferred deals	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Guaranteed	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0

Top five buy side technology in market

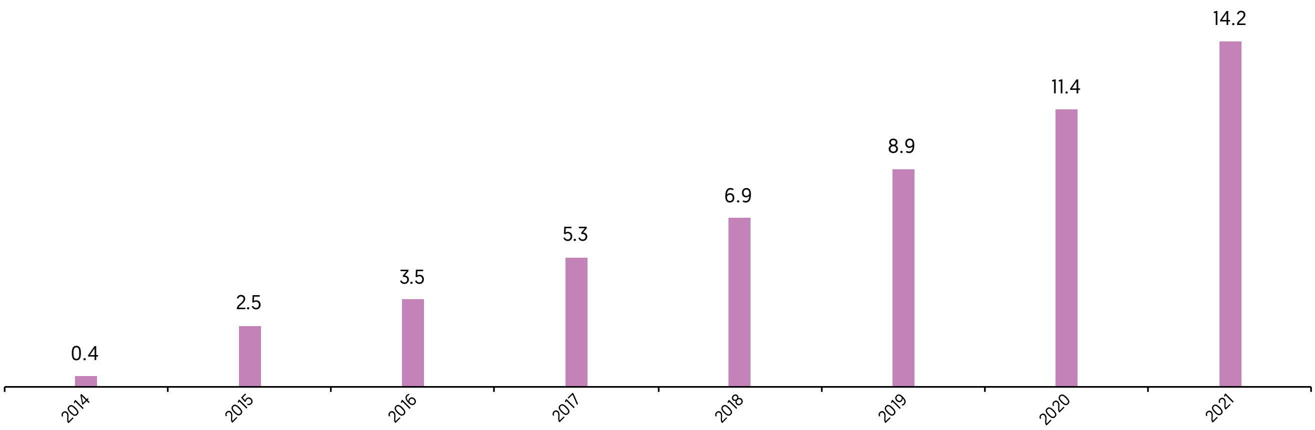
1. Doubliclick Bid Manager
2. Appnexus
3. Adform
4. Mediamath
5. Rubicon Project

Top five sell side vendors in market

1. Rubicon Project
2. Doubleclick for Publishers
3. Appnexus
4. Adform
5. Gemius SmartRTB

Source: IAB Hungary, Zenith estimates

Programmatic share of display advertising spend (%)



Programmatic technology has become more popular in Hungary over the past few years, although budgets are still relatively small. Spending increased by 48% in 2018, but it is still at a fairly low level, accounting for only a small percentage of total digital spend. However, we expect further growth in the coming years driven by rising demand, and the increasing availability of new formats, novel deal types and rising volumes of data usage.

Hungary used to be an ‘open RTB’-only market. More key agencies and media owners have started to use private marketplace deals, although in 2018 these still only accounted for 4% of the total.

The Hungarian market leans towards self-service. In terms of biddable media, Google Display and Etarget are still dominant.

Programmatic buying will continue to increase significantly over the next few years as the diversification of inventory formats continues. Education, clear processes and agreed market standards are key for further development. We are not seeing any signs of programmatic becoming available in any traditional media channels soon.

India

Forecasts

Advertising spend (INR mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	10,015.6	22,034.3	28,203.9	36,665.1	50,530.3	72,284.0	97,522.7	128,729.9	167,348.9	209,133.9
Total display	5,621.0	12,366.0	15,828.0	20,756.0	34,902.3	43,343.4	57,538.4	78,525.2	97,062.3	112,107.0
Banners + other traditional display	*5,161.0*	*10,995.0*	*13,040.0*	*16,686.0*	*25,617.3*	*31,207.2*	*39,126.1*	*48,685.6*	*58,237.4*	*59,693.3*
Video	*460.0*	*1,371.0*	*2,788.0*	*4,070.0*	*9,285.0*	*12,136.2*	*18,412.3*	*29,839.6*	*38,824.9*	*52,413.7*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (INR mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	1,690.9	3,621.5	5,563.8	7,928.5	12,518.8	21,314.0	32,500.0
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Top five buy side technology in market

1	DV360
2	Appnexus
3	Mediamath
4	Brightroll
5	Pubmatic

Top five sell side vendors in market

1	Double Click Exchange
2	Openx
3	Rubicon
4	Brightroll
5	Appnexus

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.51	0.74	0.80	1.61	0.54
Display	-	-	0.51	0.72	0.54	0.79	0.54
Mobile	-	-	-	0.96	0.70	3.69	3.26
Video	-	-	-	6.86	2.12	4.95	-
Social	-	-	-	-	-	-	-

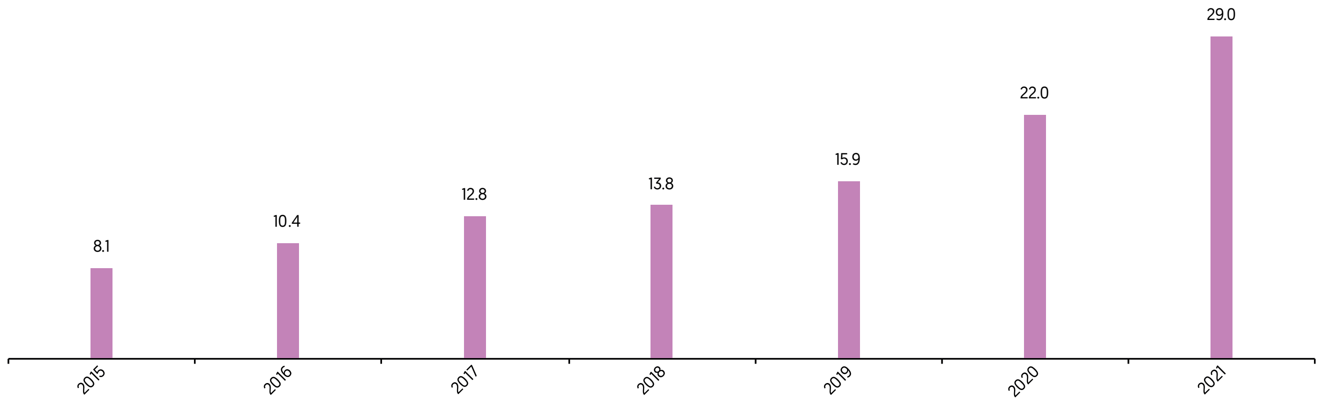
Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.80	0.67	0.52	0.57	0.13
Display	-	-	0.80	0.71	0.49	0.43	0.13
Mobile	-	-	-	0.25	1.14	0.75	0.26
Video	-	-	-	0.26	0.57	0.71	-
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.06	0.11	0.15	0.28	0.43
Display	-	-	0.06	0.10	0.11	0.18	0.43
Mobile	-	-	-	0.38	0.06	0.49	1.23
Video	-	-	-	2.68	0.37	0.70	-
Social	-	-	-	-	-	-	-

Programmatic share of display advertising spend (%)



India is among the fastest growing advertising markets in the world. This is partly thanks to the sheer size of the economy, as well as the greater push towards 'Digital India'. With disruptive technologies increasingly becoming part of the advertising sector in the country, programmatic advertising has become a dominant trend.

Advertising is becoming more customer-centric and dynamic. Until a few years ago, ad space was being booked manually, which entailed painstaking meetings, hierarchical bottlenecks, and extended negotiations. With the number of publishers multiplying overnight, it became impossible for advertisers to keep pace with supply. It was obvious for automation to intervene and take control. Programmatic advertising has made life easier for advertisers by:

- Cutting out middlemen and simplifying the process
- Making ads more target-oriented by using data for audience profiling
- Giving a better ROI

The current penetration of programmatic in India is around 16%, and one of the drivers of this growth is programmatic guaranteed. Typically, when people look at programmatic from a publisher's perspective, they look at premium inventories like the homepage, masthead or a premium video. Usually publishers are not keen to put that in the programmatic environment because they want a fixed price and a guaranteed volume. Programmatic guaranteed allows publishers to trade the price and have a guaranteed volume with an agency. Moreover, it has replaced the manual process with an automated one and brought efficiency.

Google and agencies are the main suppliers of programmatic education in the Indian market. Clients want to use it to help increase media efficiency by 15%-20%. Advertisers are currently using it for branding purposes only. One of the biggest barriers is transparency; most of the time agencies are not giving access to advertisers.

Big advertisers have invested in their own tech, and have moved all their budgets to programmatic. They understand the power of it, and how to use it properly for creative personalization and effective audience buying.

Programmatic is going to be a game changer in India over the next few years, with better fraud detection and automation policies.

Ireland

Top five buy side technology in market	
1	Google
2	Trade Desk
3	Amobee
4	Adobe
5	MediaMath

Top sell side vendors in market	
1	DoubleClick Ad Exchange
2	OpenX
3	Rubicon
4	BidSwitch
5	PubMatic

Source: Core Media

Google continues to dominate in this market across all categories except DMP. Google is the preferred tech stack for most or all agency trading desks. Amobee is also widely used for video buying, while Trade Desk is used less frequently.

There are still very few publishers or clients in this market who have invested in DMP technology, though. This is down to the scale of the market, and the limited ROI most brands get from a DMP in a smaller market.

Programmatic continues to grow in Ireland, driven by increased investment in video. Display has levelled off.

The biggest trend affecting growth within the publisher community is a lack of support for non-standard and custom creative formats.

Each agency holding group within Ireland has a different way of managing its trading desks and programmatic spending. Some opt to use a combination of self-service and managed services, while others only use programmatic for display and/or small amounts of video. Managed services are being used in cases where agencies have not invested fully in their trading desks or under-resourcing.

In terms of type of deal, again different trading desks have different setups within Ireland. Some only trade in the open exchange and/or buy programmatic guaranteed. Others don't buy any programmatic guaranteed at all, and fully use the open exchange and private marketplaces.

This market is, largely, well-versed in programmatic. Most display and VOD activity is bought programmatically. Education is largely agency-led.

There is still very little adoption of programmatic within traditional media apart from TV (Sky AdSmart) and radio. Some audio inventory is being bought programmatically with the local radio stations and the likes of SoundCloud. One challenge here is that in this market, one sales house has control over Spotify and will not release the inventory programmatically.

The larger OOH companies continue to be apprehensive, based on the investment needed for more digital screens and the technology needed to buy and sell media. Smaller more niche offerings specialising in DOOH have made bigger strides, although there has been no programmatic activation as of yet.

Italy

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	1,438.3	1,586.9	1,709.5	1,838.0	1,982.6	2,178.2	2,489.1	2,660.7	2,862.1	3,047.8
Total display	894.9	1,014.9	1,051.5	1,133.9	1,237.6	1,381.1	1,630.1	1,780.2	1,968.4	2,140.7
Banners + other traditional display	*755.2*	*793.1*	*807.2*	*851.5*	*859.0*	*920.3*	*992.6*	*984.2*	*997.5*	*998.1*
Video	*139.7*	*221.8*	*244.2*	*282.4*	*378.6*	*460.7*	*637.5*	*795.9*	*970.8*	*1,142.6*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	7.1	42.2	91.4	191.4	260.3	361.8	497.8	585.3	686.9	762.0
Banners + other traditional display	*6.8*	*37.5*	*74.0*	*136.5*	*182.2*	*231.5*	*273.8*	*275.1*	*309.1*	*320.0*
Video	*0.3*	*4.8*	*17.4*	*54.9*	*78.1*	*130.2*	*224.0*	*310.2*	*377.8*	*441.9*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	7.1	40.6	73.1	134.0	156.2	217.1	248.9	263.4	274.8	289.5
Private marketplaces	0.0	1.7	16.4	45.9	70.3	72.4	79.7	93.7	109.9	114.3
Preferred deals	0.0	0.0	1.8	7.7	20.8	36.2	89.6	111.2	137.4	160.0
Guaranteed	0.0	0.0	0.0	3.8	13.0	36.2	79.7	117.1	164.9	198.1

Top five buy side technology in market

1	DV360
2	Amazon
3	Verizon
4	The Trade Desk
5	Mediamath

Top five sell side vendors in market

1	Adex
2	Appnexus
3	Rubicon
4	Smartadserver
5	OpenX

Source: Zenith, Politecnico, eMarketer

Programmatic spend - emerging media channels (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Newspapers	-	-	-	-	-	-	-	-	-	-
Magazines	-	-	-	-	-	-	-	-	-	-
TV	-	-	-	-	-	-	-	-	-	-
Radio	-	-	-	-	-	-	4.6	4.7	5.5	8.0
Cinema	-	-	-	-	-	-	-	-	-	-
Out-of-home	-	-	-	-	-	-	1.8	4.0	6.0	7.8

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.77	1.28	1.79	3.27	4.01	3.19	7.09
Display	0.63	0.68	1.19	2.19	2.78	2.20	2.95
Mobile	0.63	0.68	1.50	2.01	1.79	0.98	2.48
Video	0.85	0.90	12.12	10.54	11.14	9.78	11.81
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.93	0.96	0.87	1.26	1.77	1.81	1.31
Display	0.85	0.90	1.53	2.49	1.84	1.91	1.28
Mobile	0.85	0.90	0.50	0.80	0.78	0.45	-
Video	1.62	1.03	0.52	0.75	1.82	1.74	1.94
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

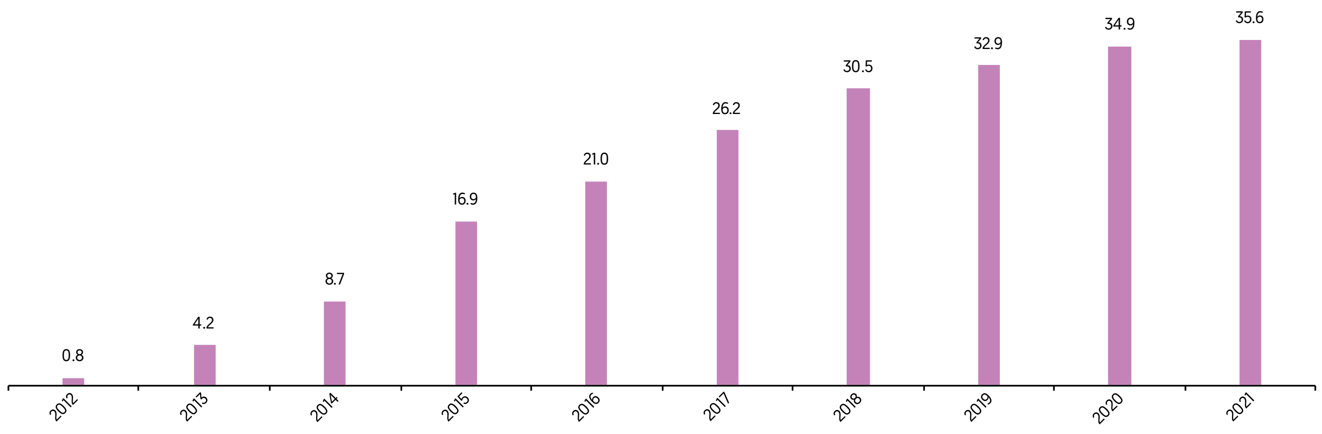
	2012	2013	2014	2015	2016	2017	2018
Overall	0.08	0.13	0.20	0.26	0.23	0.18	0.47
Display	0.07	0.08	0.08	0.09	0.15	0.12	0.35
Mobile	0.07	0.08	0.30	0.25	0.23	0.22	0.83
Video	0.07	0.08	2.35	1.41	0.61	0.56	-
Social	-	-	-	-	-	-	-

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	-	75.0

Source: Zenith estimates

Programmatic share of display advertising spend (%)



The Italian market is still dominated by Google in terms of programmatic technologies, both on the DSP and SSP side. But there are other important players, which are gaining relevance in terms of ad spending and market share. Key global players, such as Verizon and Amazon, are also expanding within the Italian market.

An increasing number of clients now have their own DMP technologies, and the three main global players are Oracle, Adobe and Salesforce.

Growth in programmatic trading has partially been driven by the pull of more mature markets, as international players have entered the Italian market and pushed new technological solutions for efficiency.

On the local side, programmatic is growing because it allows more budget control, better KPIs and a higher return on investment. The market is quite mature in Italy now, so growth has slowed a little.

In general, the global programmatic players are choosing to use market technologies instead of full service. Self-service platforms allow budget monitoring, platform control and more economic sensitivity. In addition, they can optimize the planning process, saving hours dedicated to managing pure planning activities.

In Italy, most deals are still delivered in open market, but the contribution of private marketplaces is increasing, together with guaranteed deals. By distributing budgets across deals, there is the possibility to diversify strategies, address and monitor KPIs, and satisfy client needs by reaching target audiences, depending on the campaign objectives.

The market evolution on the publisher side of programmatic is complete. A few years ago the big 'institutional' publishers (i.e. those with a traditional media background, such as TV and printed press) approached the programmatic arena with difficulty; this was due to the control of CPM, which is not fixed as it is for traditional buying. However, now all of them use data and technology to push their inventory.

When looking at the differentiation between direct and programmatic, we can see how some formats still need to be bought in a traditional way because of their nature (for example, to guarantee exclusivity on the page).

Addressable TV, DOOH and radio are taking their first steps in programmatic sales; inventory for these media is increasing.

In 2020, we will be keeping an eye on the evolution related to ITP (Intelligent Tracking Prevention), which could limit the usage of third party tracking cookies. This would mean first party data and contextual targeting become even more important.

Latvia

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	10.9	10.2	10.7	14.7	15.8	18.2	19.7	20.0	20.5	21.0
Total display	-	-	-	-	-	15.5	15.8	16.3	16.8	18.9
Banners + other traditional display	-	-	-	-	-	*10.9*	*10.5*	*10.6*	*10.5*	*11.5*
Video	-	-	-	-	-	*3.6*	*4.3*	*4.7*	*5.3*	*6.4*
Native	-	-	-	-	-	*0.9*	*0.9*	*1.0*	*1.0*	*1.0*

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	-	-	5.0	5.8	6.8	8.4	9.2
Banners + other traditional display	-	-	-	-	-	*3.0*	*3.2*	*3.6*	*4.4*	*4.8*
Video	-	-	-	-	-	*1.5*	*2.2*	*2.6*	*3.2*	*3.5*
Native	-	-	-	-	-	*0.5*	*0.5*	*0.6*	*0.8*	*0.9*

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	-	-	-	4.2	4.8	5.5	6.6	7.2
Private marketplaces	-	-	-	-	-	0.2	0.3	0.4	0.6	0.6
Preferred deals	-	-	-	-	-	0.1	0.2	0.3	0.4	0.4
Guaranteed	-	-	-	-	-	0.4	0.5	0.7	0.9	1.0

Top buy side technology in market

1 Adform
2 Google Ads

Top sell side vendors in market

1 Google Ad Manager
2 Adform

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	3.00	3.20	3.30
Display	-	-	-	-	2.00	2.50	2.50
Mobile	-	-	-	-	2.50	3.00	3.00
Video	-	-	-	-	10.00	8.00	8.00
Social	-	-	-	-	1.50	1.70	1.75

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	0.25	0.30	0.30
Display	-	-	-	-	0.25	0.30	0.30
Mobile	-	-	-	-	0.25	0.30	0.30
Video	-	-	-	-	0.20	0.20	0.20
Social	-	-	-	-	0.20	0.25	0.35

Average programmatic CTR by media channel (%)

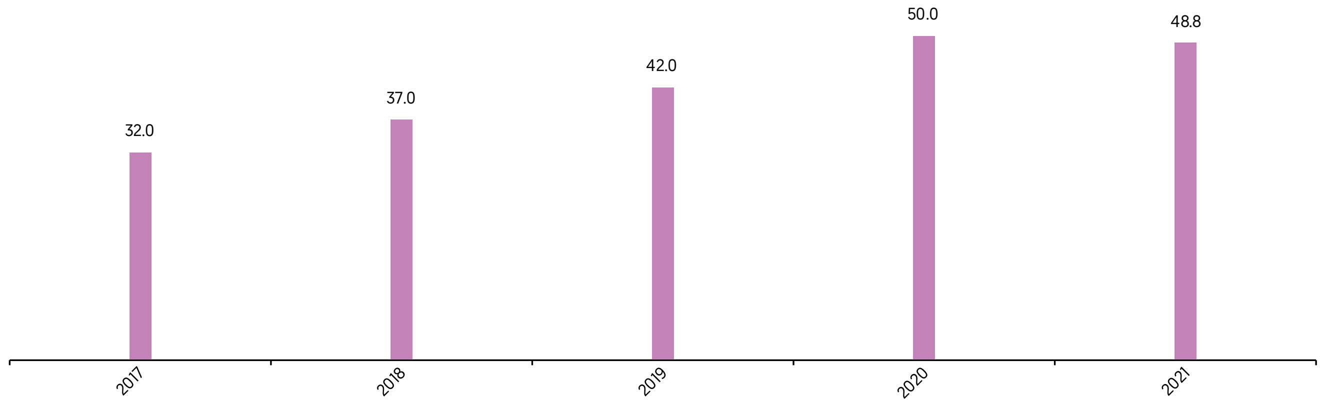
	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	0.12	0.12	0.12
Display	-	-	-	-	0.10	0.90	0.08
Mobile	-	-	-	-	0.30	0.25	0.23
Video	-	-	-	-	2.00	1.70	1.30
Social	-	-	-	-	0.50	0.40	0.35

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	0.9	0.9	0.9

Source: Zenith estimates

Programmatic share of display advertising spend (%)



The most popular precision buying platforms are Facebook and Google Ads, and their functionality covers the needs of most local advertisers. Some local players are opening their stocks to programmatic buying as well, e.g. Delfi, Tvplay, AdQuota, and Adnet. With regards to DSP technologies, the main players are Adform and Google Ads.

Open auction is the most popular type of deal as clients are still very price sensitive when it comes to programmatic. However, private deals are gaining traction as well, as more and more publishers offer their inventory for private deals. Currently it takes considerable technical implementation, which takes time and resources that can sometimes impede the process.

Self-service platforms are becoming more popular. Managed service is not used for global players, at least among agencies, because it makes an agency price proposal non-competitive for the market. However, managed service remains when buying through ad networks, which still have agency retro-bonus systems.

Within the publisher community, the key drivers are still Google and Facebook, which are taking share of the market from local players.

Programmatic buying of TV, radio and OOH is not available in Latvia, and there are no signs that publishers of traditional media are keen to give away their inventory to third party platforms.

Over the next five years, programmatic will continue its growth in Latvia. The lines between traditional and online media will become blurred.

Lithuania

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	13.1	18.8	23.5	34.0	50.0	58.4	68.8	78.0	87.5	94.8
Total display	11.0	13.0	16.1	20.5	26.0	30.4	32.7	38.2	41.5	44.5
Banners + other traditional display	*10.0*	*11.3*	*13.3*	*15.4*	*18.0*	*20.2*	*21.0*	*23.4*	*25.4*	*28.4*
Video	*1.1*	*1.7*	*2.8*	*5.1*	*8.0*	*10.2*	*11.7*	*14.8*	*16.1*	*16.1*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	-	-	7.4	10.3	14.5	18.7	20.0
Banners + other traditional display	-	-	-	-	-	*6.1*	*7.4*	*9.4*	*11.4*	*12.8*
Video	-	-	-	-	-	*1.3*	*2.9*	*5.2*	*7.2*	*7.2*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	-	-	-	6.3	8.5	11.8	15.0	16.0
Private marketplaces	-	-	-	-	-	0.2	0.3	0.6	0.7	0.8
Preferred deals	-	-	-	-	-	0.6	0.9	1.4	1.9	2.0
Guaranteed	-	-	-	-	-	0.3	0.5	0.8	1.1	1.2

Top buy side technology in market

1. Adform DSP
2. Google Display & Video 360
3. Adnet DMP/DSP

Top five sell side vendors in market

1. Delfi.lt
2. 15min.lt
3. Lrytas.lt
4. VisaLietuva.lt
5. ASA.lt

Source: KANTAR, Publicis

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	3.00	3.20	3.30
Display	-	-	-	-	2.00	2.50	2.50
Mobile	-	-	-	-	2.50	3.00	3.00
Video	-	-	-	-	10.00	8.00	8.00
Social	-	-	-	-	1.50	1.70	1.75

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	0.25	0.30	0.30
Display	-	-	-	-	0.25	0.30	0.30
Mobile	-	-	-	-	0.25	0.30	0.30
Video	-	-	-	-	0.20	0.20	0.20
Social	-	-	-	-	0.20	0.25	0.35

Average programmatic CTR by media channel (%)

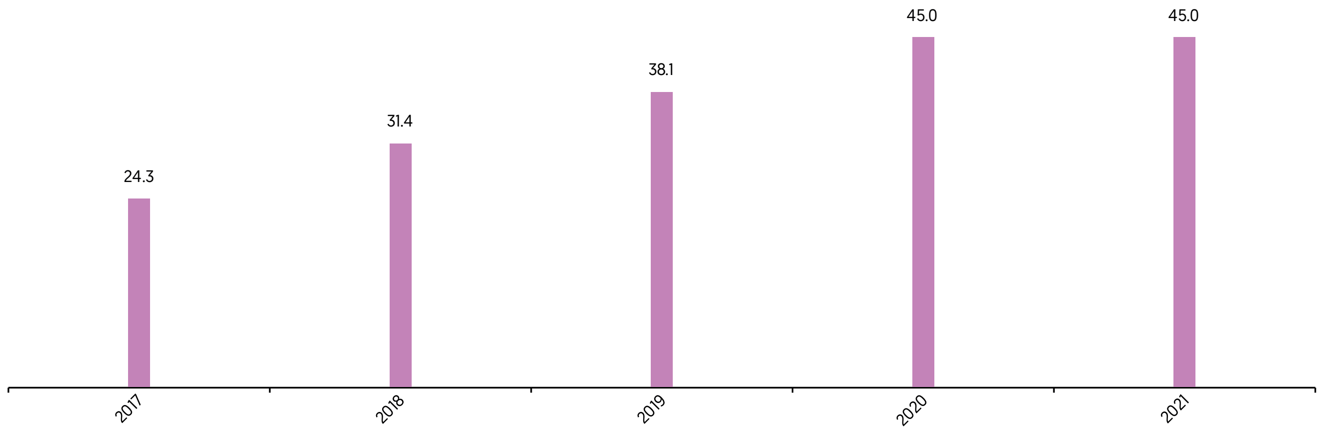
	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	0.12	0.12	0.12
Display	-	-	-	-	0.10	0.90	0.08
Mobile	-	-	-	-	0.30	0.25	0.23
Video	-	-	-	-	2.00	1.70	1.30
Social	-	-	-	-	0.50	0.40	0.35

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	0.9	0.9	0.9

Source: Zenith estimates

Programmatic share of display advertising spend (%)



Precision media buying continues its growth in the Baltics. Key growth drivers are Facebook and Google, which are walled gardens and bought separately, not via DSP or agency trading desks. In this market, we see digital-savvy start-ups side by side with very traditional, TV-led advertisers. During the last year, we have seen increased demand for advanced solutions in planning, buying and reporting on digital advertising. However, local audiences and budgets are relatively small.

The key factors in programmatic's growth have been pressure from international clients, lower prices compared to direct buys, and the possibility of more accurate targeting. There is no problem with accessing modern DSP technologies, the main players in the Baltics being Adform and Google Ads/Google Display & Video.

To try to compete with the big two, local players are also developing their own algorithmic buying solutions. In Lithuania, the key player is Delfi Group, which recently launched its own DMP and is investing in development of AdNet – the biggest local display and video advertising network.

Self-service platforms are getting more and more popular. Managed service is not used for global players, at least among agencies, because it makes an agency price proposal non-competitive for the market or totally kills the revenue. However, managed services are still offered when buying through ad networks that still have agency retro-bonus systems.

Open auction is the most popular type of deal since clients are still very price-sensitive when it comes to programmatic. Direct buys via programmatic pipelines are not very popular because they imply additional ad tech costs, which may be eliminated by simply using direct buying.

Programmatic buying of TV, radio and OOH is not available and there are no signs yet of traditional media publishers being eager to give away their inventory to third-party platforms.

Malaysia

Forecasts

Advertising spend (RM mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	202.7	233.1	841.5	1,051.9	1,314.8	1,578.0	1,868.0	2,173.0	2,507.0	2,685.0
Total display			461.7	498.9	609.9	823.0	1,018.4	1,119.5	1,235.4	1,517.0
Banners + other traditional display			*304.8*	*319.0*	*366.0*	*461.0*	*570.3*	*604.5*	*642.4*	*743.3*
Video			*74.0*	*90.0*	*146.0*	*247.0*	*325.9*	*380.6*	*432.4*	*561.3*
Native			*83.0*	*90.0*	*98.0*	*115.0*	*122.2*	*134.3*	*160.6*	*212.4*

Programmatic spend (RM mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	115.9	150.0	189.0	239.0	325.9	434.2	547.5	637.2
Banners + other traditional display	-	-	*76.0*	*93.0*	*113.0*	*138.0*	*182.5*	*238.8*	*301.1*	*337.7*
Video	-	-	*18.0*	*27.0*	*45.0*	*69.0*	*107.5*	*152.0*	*191.6*	*235.7*
Native	-	-	*21.0*	*30.0*	*30.0*	*31.0*	*35.8*	*43.4*	*54.8*	*63.7*

Programmatic spend by type of deal (RM mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	113.9	147.0	179.0	224.9	293.3	377.7	454.4	490.6
Private marketplaces	-	-	0.0	0.0	2.0	5.0	13.0	26.0	43.8	70.1
Preferred deals	-	-	0.0	0.0	2.0	2.0	6.5	13.0	21.9	38.2
Guaranteed	-	-	2.0	3.0	6.0	7.0	13.0	17.4	27.4	38.2

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.60	1.02	1.55	1.42	2.31
Display	-	-	0.60	1.02	1.18	1.20	1.56
Mobile	-	-	0.45	-	-	4.26	-
Video	-	-	-	-	7.00	11.25	7.11
Social	-	-	-	-	-	-	-

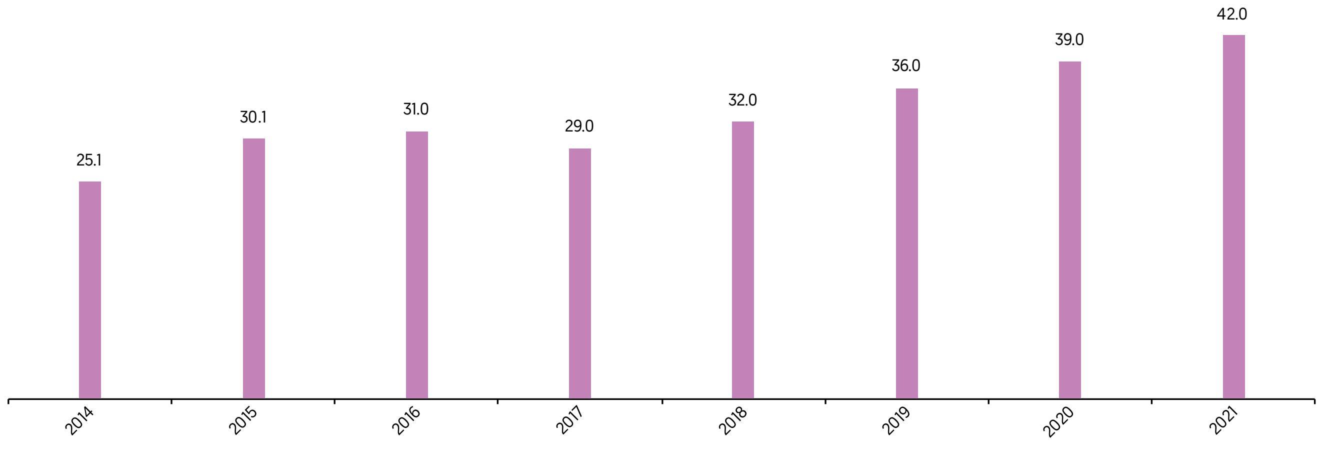
Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.43	1.03	1.36	0.68	1.05
Display	-	-	0.43	1.03	1.15	0.57	1.80
Mobile	-	-	0.39	-	-	2.46	-
Video	-	-	-	-	2.46	1.36	0.66
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.14	0.10	0.11	0.21	0.22
Display	-	-	0.14	0.10	0.10	0.21	0.09
Mobile	-	-	0.11	-	-	0.17	-
Video	-	-	-	-	0.28	0.83	1.07
Social	-	-	-	-	-	-	-

Programmatic share of display advertising spend (%)



The key factor for growth is accessibility. Programmatic used to be a little intimidating for clients, but simplified dashboards have demystified the process considerably.

While managed service remains the preferred method, there has been a big rise in self-service models, which allow traders to maximise efficiency between different DSPs and ad networks.

Direct deals are still the most common method of working. That said, there has been a rise in PMP offerings in a bid to take away some control from the biggest platforms.

Moldova

Forecasts

Advertising spend (Leu mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	19.4	29.6	38.8	56.4	72.8	79.1	91.3	109.2	125.6	144.4
Total display	-	-	-	-	-	-	-	-	-	-
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (Leu mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	-	0.1	1.1	1.7	2.6	3.5	5.5
Banners + other traditional display	-	-	-	-	*0.1*	*0.3*	*0.7*	*1.0*	*1.5*	*2.2*
Video	-	-	-	-	*0.1*	*0.8*	*1.0*	*1.4*	*1.7*	*2.7*
Native	-	-	-	-	-	-	-	*0.1*	*0.3*	*0.6*

Programmatic spend by type of deal (Leu mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	-	-	0.1	1.1	1.6	2.3	2.7	4.2
Private marketplaces	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Preferred deals	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Guaranteed	-	-	-	-	0.0	0.0	0.1	0.3	0.7	1.3

Top buy side technology in market

1	Google Marketing Platform

Top five sell side vendors in market

1	Google
2	Numbers
3	MyTarget
4	Facebook
5	NovaWeb

Source: Zenith

There are few programmatic platforms and specialists in Moldova, and there is a relative lack of knowledge about it in the market. However, the number of programmatic campaigns is growing. There are several reasons behind this growth:

- The quantity of available inventory
- Lower costs than on other platforms
- Larger and more precise coverage of the audience
- Complete integration of planning, launching and reporting tools

The most common type of deal used is open (RTB).

There has recently been a boom in e-commerce platform launches. While there is little investment in Moldova from the global giants, for whom it is too small a market, Moldova provides DSPs from the local region a good opportunity to test their platforms and gain some business, especially given the absence of interest from the big players.

Netherlands

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	1,158.0	1,255.0	1,397.0	1,491.0	1,649.0	1,784.0	1,927.0	2,074.0	2,161.0	2,251.0
Total display	476.0	520.0	582.0	606.0	649.0	685.0	728.0	772.0	804.0	838.0
Banners + other traditional display	*424.0*	*463.0*	*507.0*	*473.0*	*480.3*	*479.5*	*502.3*	*525.0*	*538.7*	*544.7*
Video	*52.0*	*57.0*	*75.0*	*95.0*	*116.8*	*154.1*	*167.4*	*181.4*	*197.0*	*213.7*
Native	-	-	-	*38.0*	*51.9*	*51.4*	*58.2*	*65.6*	*68.3*	*79.6*

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	75.0	104.0	144.0	187.0	224.0	263.0	292.0	315.0	330.0	342.0
Banners + other traditional display	*74.3*	*100.9*	*136.8*	*168.3*	*188.2*	*205.1*	*213.2*	*230.0*	*240.9*	*249.7*
Video	*0.8*	*3.1*	*5.8*	*16.8*	*33.6*	*55.2*	*73.0*	*78.8*	*82.5*	*85.5*
Native	-	-	*1.4*	*1.9*	*2.2*	*2.6*	*5.8*	*6.3*	*6.6*	*6.8*

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	58.5	81.1	113.8	144.0	159.0	156.7	153.7	165.8	173.7	180.0
Private marketplaces	7.5	11.4	17.3	22.4	40.3	81.1	95.3	102.8	107.7	111.6
Preferred deals	-	-	-	-	-	-	-	-	-	-
Guaranteed	9.0	11.4	13.0	20.6	24.6	25.2	43.0	46.4	48.6	50.4

Top five buy side technology in market

1 DV360
2 Adform
3 The Trade Desk
4 AppNexus
5 MediaMath

Top five sell side vendors in market

1 Google Ad Manager
2 SpotX
3 AppNexus
4 Improve Digital
5 Rubicon

Source: IAB, Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	1.55	1.48	3.29	4.85	6.63	7.69	7.70
Display	1.55	1.55	3.32	3.59	3.93	4.51	5.53
Mobile	1.55	1.55	1.75	2.43	3.62	5.46	6.87
Video	2.37	1.43	12.75	16.68	15.81	15.07	15.92
Social	-	-	-	-	-	-	-

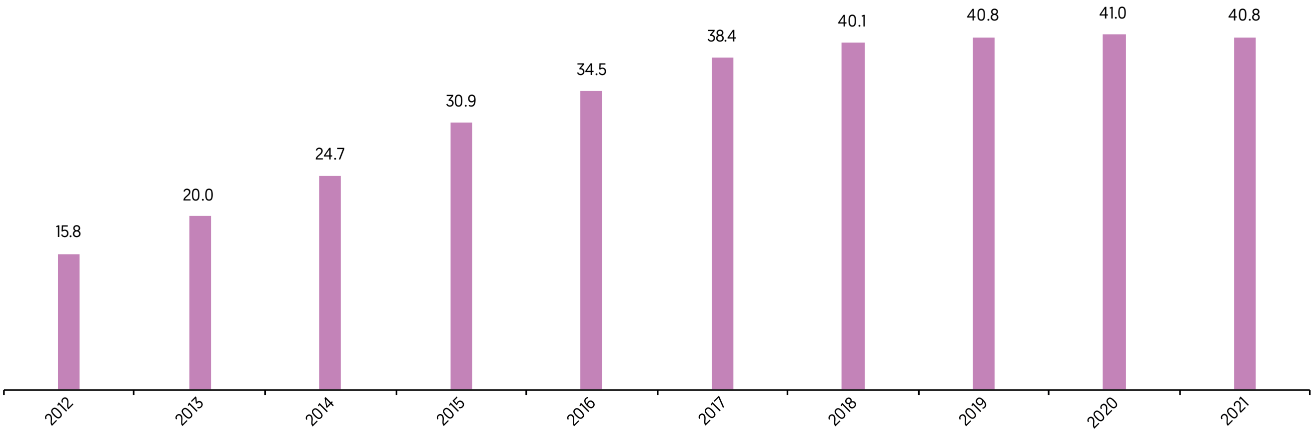
Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	2.37	1.21	2.21	1.82	3.05	3.88	3.86
Display	2.37	1.43	3.52	3.34	2.75	2.98	3.22
Mobile	2.37	1.43	0.86	0.68	1.48	3.21	-
Video	-	-	0.72	1.83	3.63	4.90	5.25
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.07	0.12	0.15	0.27	0.22	0.20	0.20
Display	0.07	0.11	0.09	0.11	0.14	0.15	0.17
Mobile	0.07	0.11	0.20	0.35	0.25	0.17	-
Video	0.07	0.11	1.78	0.91	0.44	0.31	0.30
Social	-	-	-	-	-	-	-

Programmatic share of display advertising spend (%)



The current adoption of programmatic technology in the Netherlands is very high. The most popular ad servers are Google Campaign manager, Adform and Sizmek. Google has also increased its share of the SSP market, although there is some competition from local SSP Improve Digital and video-focused platforms like SpotX. DV 360 dominates the DSP market, but there is room for a few other providers like Adform, Mediamath and The Trade Desk.

There has been an increase in DMP adoption, mostly on the advertiser side.

All agencies have their own trading desk, and consulting firms are buying and integrating stand-alone trading desks. Managed service is not common in the market. More advertisers have started building relationships with tech vendors as the first step to in-housing programmatic.

Commonly we work with PMPs (non-guaranteed inventory). We are using these more and more to improve quality of delivery and also to use publisher data. Programmatic guaranteed (fixed price and volume) is also being used, mostly for buys with YouTube (MCN networks or via Google).

All major publishers have moved towards header bidding and first-price auctions. They are also looking for ways to tap into the increasing demand for video, for instance by creating more outstream inventory.

There is a large gap between advertisers that are well informed about programmatic and ad tech, and those that have very limited knowledge. On both sides, however, we see a big appetite for more knowledge. Education is mainly led by industry bodies (for example, the IAB), tech vendors and agencies.

Traditional media vendors are still being slow to adopt programmatic technology. DOOH has picked up faster, as dedicated DOOH DSPs are currently in use.

New Zealand

Forecasts

Advertising spend (NZD mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	366.0	471.0	589.0	694.0	870.0	785.0	903.0	993.0	1,072.0	1,179.0
Total display	114.0	136.0	140.0	167.0	194.0	181.0	180.0	184.0	186.0	186.0
Banners + other traditional display	*114.0*	*134.6*	*137.2*	*157.5*	*159.7*	*148.6*	*144.0*	*143.6*	*144.4*	*143.3*
Video	-	*1.4*	*2.8*	*6.7*	*29.1*	*25.3*	*27.0*	*29.4*	*29.8*	*29.8*
Native	-	-	-	*2.8*	*5.2*	*7.1*	*9.0*	*10.9*	*11.8*	*13.0*

Programmatic spend (NZD mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	2.3	4.1	5.6	6.7	29.1	54.3	72.0	82.8	88.4	94.9
Banners + other traditional display	*2.3*	*4.0*	*5.5*	*6.4*	*24.6*	*45.7*	*56.9*	*61.2*	*65.3*	*70.1*
Video	-	*0.0*	*0.1*	*0.3*	*4.4*	*8.1*	*14.4*	*20.7*	*22.1*	*23.7*
Native	-	-	-	*0.0*	*0.2*	*0.5*	*0.7*	*0.9*	*1.0*	*1.0*

Programmatic spend by type of deal (NZD mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	2.3	4.1	5.3	6.2	23.9	43.4	46.8	46.4	44.2	42.7
Private marketplaces	0.0	0.0	0.3	0.1	2.9	5.4	8.6	9.9	10.6	11.4
Preferred deals	0.0	0.0	0.0	0.3	1.5	3.8	10.8	14.1	17.7	21.8
Guaranteed	0.0	0.0	0.0	0.1	0.9	1.6	5.8	12.4	15.9	19.0

Top five buy side technology in market

1. Display & Video 360
2. Media Math
3. Trade Desk
4. Verizon
5. Adform

Top five sell side vendors in market

1. Google Ad Manger
2. AppNexus
3. Telaria
4. Rubicon
5. Pubmatic

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012*	2013*	2014	2015	2016	2017	2018
Overall	1.64	1.63	1.99	3.17	5.38	9.73	8.61
Display	1.61	1.48	1.63	2.67	3.86	4.33	3.29
Mobile	0.50	0.75	1.49	1.23	3.26	3.42	4.86
Video	21.24	17.88	14.01	21.92	19.14	15.76	13.67
Social	-	-	15.39	-	-	-	-

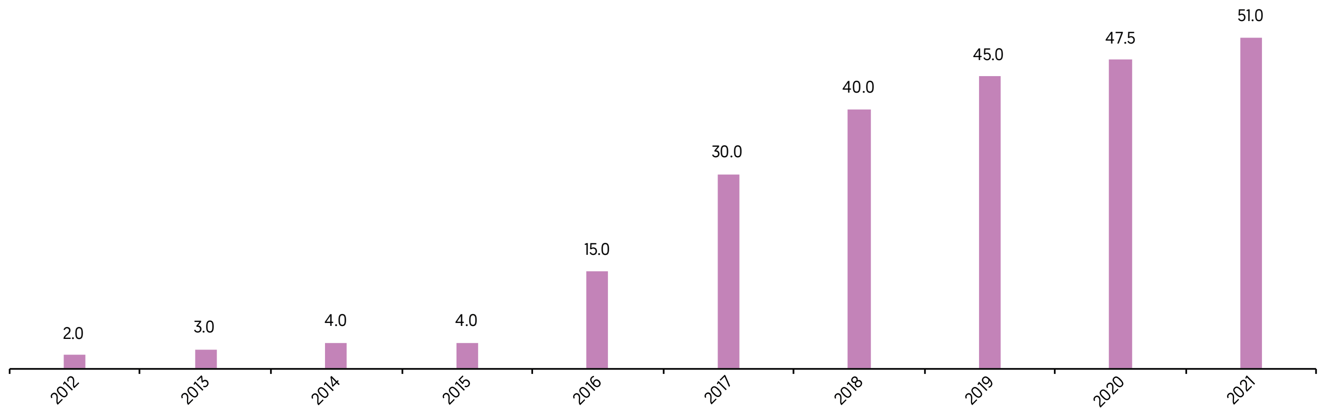
Average programmatic CPC by media channel (US$)

	2012*	2013*	2014	2015	2016	2017	2018
Overall	2.36	2.16	1.85	2.50	4.01	3.96	5.52
Display	2.60	3.19	4.47	3.52	5.74	4.52	6.63
Mobile	0.28	0.23	0.46	0.48	2.14	2.01	6.61
Video	0.36	1.03	0.63	1.73	3.72	4.02	5.29
Social	-	-	0.99	-	-	-	-

Average programmatic CTR by media channel (%)

	2012*	2013*	2014	2015	2016	2017	2018
Overall	0.07	0.08	0.11	0.13	0.13	0.25	0.16
Display	0.06	0.05	0.04	0.08	0.07	0.10	0.05
Mobile	0.18	0.32	0.32	0.26	0.15	0.17	0.07
Video	1.56	1.73	2.21	1.27	0.52	0.39	0.26
Social	-	-	1.55	-	-	-	-

Programmatic share of display advertising spend (%)



Programmatic growth has been driven by the need for agile, data-driven communication. Inherent flexibility enables clients to respond quickly to changes in the market and to action optimisation in real-time. While transparency remains an issue for some marketers, the adoption of verification services and use of safe lists is driving better informed programmatic delivery. Investment has increased within overall digital spend and is forecast to represent over half of display adspend by 2021.

From a technology perspective, Google continues to lead programmatic through both demand and supply platforms. However, on the demand side we are seeing increasing competition from Media Math, the Trade Desk and Verizon. Through the supply side, AppNexus will be affected by the demise of KPEX - Premium Kiwi Exchange. This development will see new deals made with the top local publishers to access premium local inventory. However, this could all change with another attempt to merge two major media owners (NZME and Stuff) ongoing. While RTB is still the most common way to buy, we see this reducing as publisher-arranged deals grow.

Although digitally native inventory is growing through programmatic, expansion through traditional channels remains sluggish. A fair amount of work is still required to develop infrastructure and industry standards across non-digital channels. Utilising formats like that of display advertising, digital OOH is likely to be first to open up inventory to programmatic trading. The speed at which broader programmatic delivery becomes available relies heavily upon media owners' willingness to open up their inventories.

Norway

Forecasts

Advertising spend (NKr mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	4,803.0	5,564.0	6,015.0	7,513.0	7,931.0	9,108.0	10,050.0	10,606.0	11,453.5	12,252.6
Total display	1,754.0	2,126.0	2,340.0	2,416.0	3,247.0	3,754.4	4,694.0	5,235.7	5,798.0	6,407.9
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (NKr mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	-	649.1	750.8	929.5	1,115.5	1,263.8	1,503.9
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Top buy side technology in market

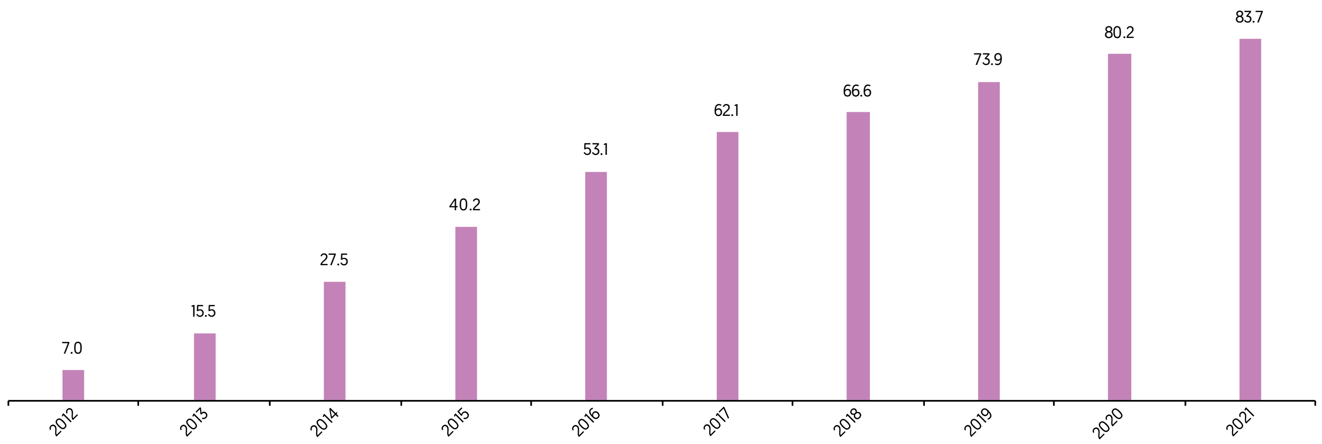
1. Google (DBM)
2. Adform

Top sell side vendors in market

1. Google (DBM)
2. Adform
3. AppNexus

Source: MBL, IRM, Zenith

Programmatic share of display advertising spend (%)



There is a large selection of programmatic vendors in the Norwegian market, but the key player is still Google (DBM), followed by Adform and AppNexus.

More inventory and placements are being released for programmatic; several placements/formats that were not previously available to buy programmatically are now possible. Programmatic has been growing steadily over the last few years, and we expect this trend to continue.

In terms of knowledge, it seems that more and more advertisers understand the concept. This could be due to a push (seminars, etc.) from both publishers and sell-side platforms.

The market is now close to 100% self-service. Most inventory from publishers is now available to buy programmatically - the only inventory that needs to be bought directly is the 'premium placements' from the biggest publishers, for example full-screen formats.

Private non-guaranteed seems to be the most common type of deal in Norway, along with open exchange buying. In the future, programmatic guaranteed might also become more widespread, but as of now it seems the publishers prefer direct buying as an alternative to this.

Some outdoor operators have been testing programmatic booking, but only on a very limited scale so far. There is still no programmatic TV or radio.

Philippines

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.38	0.49	1.60	1.63	2.69
Display	-	-	0.37	0.47	1.13	1.48	2.43
Mobile	-	-	0.22	0.39	0.42	4.83	5.53
Video	-	-	0.48	5.77	7.28	6.89	7.41
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.28	0.33	1.20	1.46	2.35
Display	-	-	0.28	0.34	1.43	1.57	2.57
Mobile	-	-	0.07	0.16	0.00	1.45	3.44
Video	-	-	1.42	0.82	0.92	0.82	1.52
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.13	0.15	0.13	0.11	0.11
Display	-	-	0.14	0.14	0.08	0.09	0.09
Mobile	-	-	0.31	0.24	14.29	0.33	0.16
Video	-	-	0.03	0.70	0.79	0.84	0.49
Social	-	-	-	-	-	-	-

Programmatic adoption is quite low in the Philippines; we estimate it accounts for around 15% of the total digital market. However, we think it will grow by around 50% a year over the next two years as local marketers' understanding of the tools becomes more sophisticated. The other driving factor has been the rollout of Precision Social, which has allowed us to migrate a number of small clients (those still on auction) from direct buys to programmatic.

Current usage centres on DSPs, with a number of suppliers including Komli, Innity and Appier actively chasing clients and agencies for business. Ad servers are barely used. There seems to be a bigger interest in DMPs, but costs are a hindrance. Knowledge of programmatic remains limited among clients, with only a few exceptions. Clients regularly have to be reminded of what programmatic delivers to see the value of spending an extra 30% on top of media costs.

Managed services predominate. Only the two leading telcos have their own in-house groups for digital media planning and buying, but they still rely on third parties like Admob to handle their programmatic buys. The level of sophistication/knowledge needed to go self-service does not yet exist in this market. The investment required (in terms of tech stack and talent) is another barrier.

The market consumes a large amount of foreign media due to the prevalence of English, and so this tends to be our biggest source of inventory. There is a tendency to jump on foreign trends and fast-rising publishers such as Buzzfeed.

We have not seen any interest in programmatic coming from traditional media channels locally. These tend to be very old-school and conservative in their marketing approach. And the OOH landscape is very fragmented, consisting of many small family-run businesses.

The only current opportunity is TV Sync, which has been in place since the end of 2016 and connects to the feeds of the two big TV networks.

Poland

Forecasts

Advertising spend (PLN mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	1,211.0	1,300.0	1,458.0	1,614.0	1,807.0	2,025.0	2,304.5	2,500.3	2,772.8	3,048.9
Total display	-	-	-	1,128.0	1,256.8	1,416.7	1,644.3	1,802.1	2,017.6	2,230.2
Banners + other traditional display	-	-	-	*859.0*	*917.3*	*964.0*	*1,097.0*	*1,161.8*	*1,257.3*	*1,343.2*
Video	-	-	-	*269.0*	*339.5*	*452.8*	*547.3*	*640.4*	*760.3*	*887.0*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (PLN mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	43.8	249.0	384.8	507.0	612.6	720.9	823.2
Banners + other traditional display	-	-	-	*37.7*	*216.0*	*260.6*	*293.0*	*320.1*	*355.1*	*354.0*
Video	-	-	-	*6.1*	*33.0*	*123.0*	*207.9*	*281.8*	*353.2*	*444.5*
Native	-	-	-	-	-	*1.1*	*6.1*	*10.7*	*12.6*	*24.7*

Programmatic spend by type of deal (PLN mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	-	39.4	211.7	290.5	318.9	364.5	410.9	457.7
Private marketplaces	-	-	-	0.9	12.5	34.6	60.8	85.8	100.9	107.0
Preferred deals	-	-	-	3.5	24.9	57.7	121.7	153.1	194.6	238.7
Guaranteed	-	-	-	0.0	0.0	1.9	5.6	9.2	14.4	19.8

Top buy side technology in market

1 Display&Video 360 by Google
2 Adform
3 AppNexus
4 MediaMath

Top five sell side vendors in market

1 DoubleClick Ad Exchange
2 Adform
3 Smart RTB+
4 Rubicon
5 AppNexus

Source: Zenith, IAB Polska, PwC AdEx, IAB Europe/IHS Markit, AdForm, eMarketer

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	1.53	1.48
Display	-	-	-	-	-	0.98	0.87
Mobile	-	-	-	-	-	0.98	0.80
Video	-	-	-	-	-	6.61	6.84
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	0.47	0.59
Display	-	-	-	-	-	0.43	0.64
Mobile	-	-	-	-	-	0.29	0.37
Video	-	-	-	-	-	0.54	0.55
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

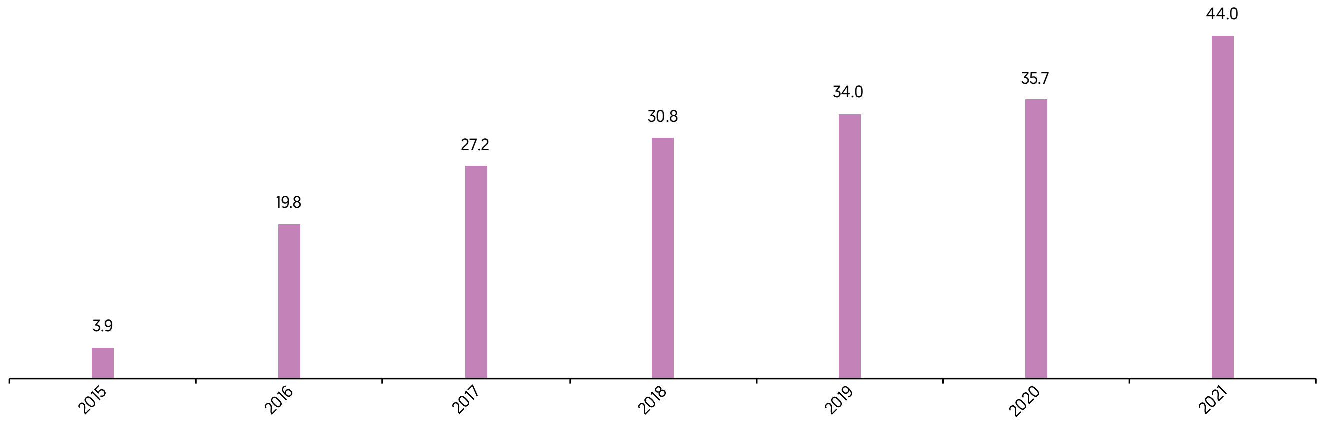
	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	0.32	0.25
Display	-	-	-	-	-	0.23	0.14
Mobile	-	-	-	-	-	0.34	0.22
Video	-	-	-	-	-	1.22	1.25
Social	-	-	-	-	-	-	-

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	58.3	56.9

Source: Zenith estimates

Programmatic share of display advertising spend (%)



The adoption of programmatic technology is quite high in Poland. Only minor publishers are not yet using RTB protocol. Among publishers, the dominant technology is Google Ad Manager (GAM), among other ad servers (Gemius AdOcean, Smart AdServer or self-developed solutions). The dominance of GAM affects other elements of tech stack. The most popular exchange is DoubleClick Ad Exchange, which has the largest potential. Other popular exchanges are Adform, Smart RTB+, TeadsTV, AppNexus and Pubmatic. Among DSPs, DV360 is the most popular, followed by Adform. Marginal and declining roles are played by MediaMath and AppNexus.

Programmatic has become one of the biggest streams of revenue for publishers. The key factor that affects growth is the yield management possible within inventory sold programmatically. Optimization, automation and market expansion, by sharing inventory on open auction with global advertisers, are the major advantages behind programmatic growth on the sell-side.

The growth of programmatic in Poland is based on many factors:

- Almost all publishers share their whole inventory via exchanges.
- Knowledge about programmatic has become widespread in the market.
- The increasing adoption of 3rd party verification tools helps to ensure brand safety and trust in programmatic buying.
- The constant development of data quality and quantity.
- The rising share of video bought programmatically (especially YouTube).

One short-term barrier to growth has been the changes to Google's environment. Switching to 1st price auction and implementing Unified Pricing Rules may affect the market in the short run, but eventually buyers and sellers will adapt, and the situation should not cause long-term negative consequences.

The majority of programmatic spend is self-service, mostly concentrated within media agencies as they are the core of programmatic knowledge on the buy-side. Some advertisers are developing in-house competence in programmatic buy, but in general, most programmatic campaigns are bought by media agencies. The managed-service model has a minor share of the market; managed-service is offered by niche DSPs, such as Teads Ads Manager.

The level of knowledge about programmatic in Poland is quite high. A series of conferences, training and workshops have paid off and brought results. Technological partners (Adform, Google) play a leading role in the education process, from which publishers and media agencies benefit. Media agencies are the first source of information about programmatic for most advertisers.

The most popular type of deal for buy-side players is the private deal. There are only four publishers that base their selling strategy on the private auction model, but it is uncertain how this model will evolve after the 100% switch to 1st price auction on Google's exchange. Programmatic guaranteed is being used by singular advertisers, usually for specific inventory that is not available any other way.

Currently we are seeing more publishers adopting programmatic technologies for Polish radio broadcasters' online audio streams. There are advertisers from retail, which are keen to invest in programmatic audio. However, this only refers to online radio streams, traditional radio is not there yet. Neither is TV, or at least not this year.

Puerto Rico

Forecasts

Advertising spend (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	25.3	40.0	47.0	50.0	55.0	49.0	54.0	56.0	58.0	61.0
Total display	25.3	40.0	47.0	50.0	55.0	49.0	54.0	56.0	58.0	61.0
Banners + other traditional display	-	-	-	-	-	*31.9*	*32.4*	*32.5*	*31.3*	*30.5*
Video	-	-	-	-	-	*14.7*	*17.8*	*19.6*	*22.6*	*25.0*
Native	-	-	-	-	-	*2.5*	*3.8*	*3.9*	*4.1*	*5.5*

Programmatic spend (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	-	-	-	3.8	5.8	7.9	10.0
Banners + other traditional display	-	-	-	-	-	-	*3.0*	*3.9*	*5.0*	*5.9*
Video	-	-	-	-	-	-	*0.8*	*1.8*	*2.7*	*3.7*
Native	-	-	-	-	-	-	*0.02*	*0.1*	*0.2*	*0.4*

Programmatic spend by type of deal (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	-	-	-	-	2.7	3.7	4.0	4.1
Private marketplaces	-	-	-	-	-	-	0.5	1.0	2.1	3.3
Preferred deals	-	-	-	-	-	-	0.5	0.7	1.0	1.4
Guaranteed	-	-	-	-	-	-	0.1	0.3	0.8	1.1

Top buy side technology in market

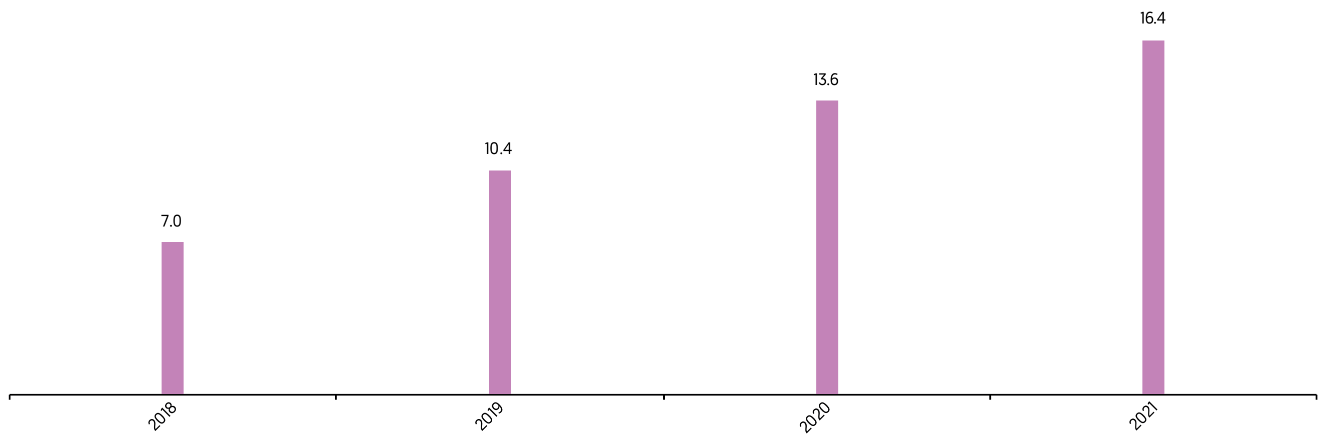
1	DV360
2	The Trade Desk
3	Sizmek

Top sell side vendors in market

1	Google
2	AppNexus
3	OpenX
4	Audio Trade

Source: Zenith

Programmatic share of display advertising spend (%)



The current market adoption of programmatic technology in Puerto Rico is low, and only top tier companies with big media budgets are working in this sector. Banking and insurance companies are among the few that use this at the moment.

There is a lack of knowledge, specifically on the client's side. Education is being led by agencies and vendors.

There has been growth in programmatic, though, for two main reasons: 1. global brands are asking for this technology to be applied in all markets; and 2. local publishers are using similar technologies and providing more options. It is estimated that around 10% of the total digital budget is spent on programmatic (both managed and self-served).

Currently, most of the programmatic spend is in managed service. Companies like Xaxis are managing this for the agencies in their group. Others, such as Eikon, Glu and Yume, also provide this service.

The most advanced publishers in Puerto Rico are the online news portals of the top print companies, such as GFR Media and Metro. Growth will be steady among companies that adopt programmatic and learn how to apply first party data to the third party data that local publishers provide.

In terms of deals, they are mostly CPMs and CPCs based on the selected audience. Most of the inventory is not on a guaranteed basis.

Within traditional media channels, only a few local newspaper portals are offering programmatic trading. Other traditional channels, like OOH and TV, are still in the development phase.

Romania

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	33.0	36.0	41.0	51.0	61.0	73.0	84.0	97.0	111.0	122.1
Total display	29.0	31.0	34.0	42.0	49.0	60.0	69.0	80.0	87.0	96.7
Banners + other traditional display	*20.0*	*19.0*	*21.0*	*25.0*	*31.0*	*34.0*	*37.0*	*38.0*	*42.0*	*45.4*
Video	*9.0*	*11.0*	*12.0*	*16.0*	*17.0*	*25.0*	*29.0*	*38.0*	*39.0*	*44.9*
Native	-	-	*1.0*	*1.0*	*1.0*	*1.0*	*3.0*	*4.0*	*6.0*	*6.5*

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	2.0	5.0	15.0	21.0	34.0	35.0	36.0
Banners + other traditional display	-	-	-	*2.0*	*4.0*	*10.0*	*11.0*	*15.0*	*14.0*	*14.4*
Video	-	-	-	-	*1.0*	*4.0*	*8.0*	*14.0*	*16.0*	*16.5*
Native	-	-	-	-	-	*1.0*	*2.0*	*5.0*	*5.0*	*5.1*

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	-	2.0	4.0	10.0	13.0	16.0	14.0	14.4
Private marketplaces	-	-	-	0.0	1.0	3.0	5.0	9.0	9.0	9.3
Preferred deals	-	-	-	0.0	0.0	2.0	2.0	5.0	9.0	9.3
Guaranteed	-	-	-	0.0	0.0	1.0	1.0	4.0	3.0	3.1

Top five buy side technology in market

1 DoubleClick Bid Manager
2 AppNexus
3 Oath
4 AdForm
5 Sizmek DSP

Top five sell side vendors in market

1 DoubleClick For Publishers
2 AppNexus
3 WhiteOrbit
4 Smart RTB
5 PUBMatic

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.81	0.79	2.18	2.12	1.98
Display	-	-	0.81	0.79	-	1.13	0.91
Mobile	-	-	-	-	-	-	-
Video	-	-	-	-	-	2.86	3.14
Social	-	-	-	-	-	2.36	1.90

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	1.20	0.65	0.18	0.47	0.55
Display	-	-	1.20	0.65	-	0.40	0.24
Mobile	-	-	-	-	-	-	-
Video	-	-	-	-	-	0.19	0.65
Social	-	-	-	-	-	0.81	0.75

Average programmatic CTR by media channel (%)

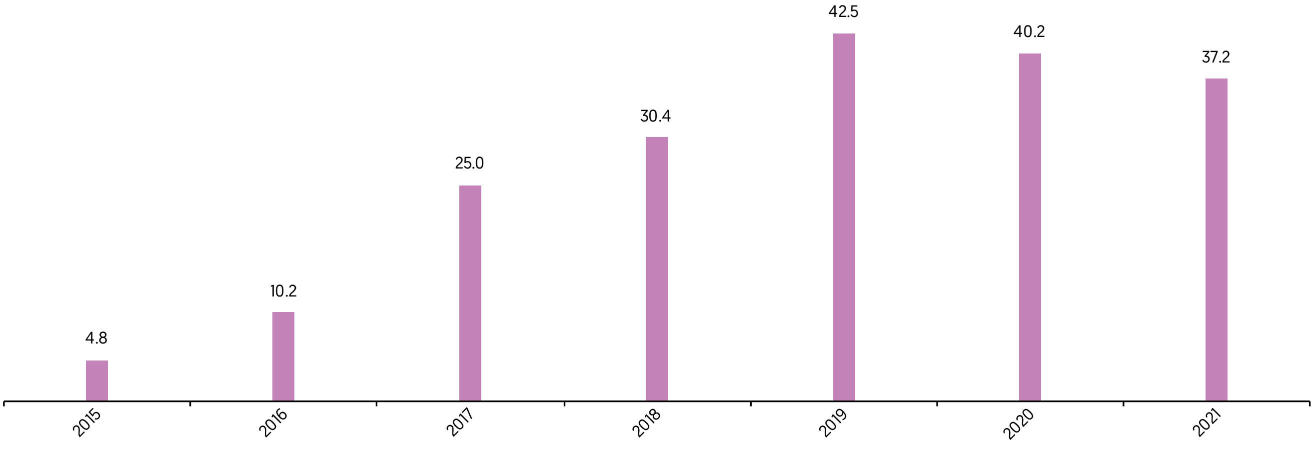
	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.07	0.12	1.21	0.36	0.37
Display	-	-	0.07	0.12	-	0.28	0.37
Mobile	-	-	-	-	-	-	-
Video	-	-	-	-	-	0.51	0.49
Social	-	-	-	-	-	0.29	0.25

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	52.0	47.3

Source: Zenith estimates

Programmatic share of display advertising spend (%)



Almost all market growth in Romania has been driven by multi-national advertisers having a clear and direct approach towards programmatic. In terms of knowledge, the market is maturing, mostly driven by big network agencies.

Large agencies are shifting towards self-service, while small agencies tend to use more managed services. Managed is driven by local re-sellers, locking out tech/data vendors.

The most common types of deal used are preferred and guaranteed.

Within the publisher community, they keep almost all quality inventory for direct sales. Publishers not wanting to sell premium inventory in programmatic deals is a hurdle that needs to be overcome.

Programmatic within traditional media channels is still non-existent. There have been attempts at a digital OOH integration, but nothing concrete.

One problem that will need to be addressed is occasional technological mismatches between SSPs and DSPs. Sometimes publishers and agencies are using different tech providers and this affects deal integration and accessing the private market inventory.

We think programmatic will continue to grow at least until integration with traditional media channels is accomplished.

Forecasts

Advertising spend (RUB mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	59,000.0	77,000.0	97,000.0	112,000.0	136,000.0	166,340.0	202,965.6	230,218.6	253,658.0	277,375.6
Total display	20,600.0	23,500.0	23,860.0	24,700.0	27,840.0	34,340.0	39,991.4	42,798.3	45,508.4	48,411.0
Banners + other traditional display	-	*20,100.0*	*19,100.0*	*19,100.0*	*21,200.0*	*26,000.0*	*29,900.0*	*31,395.0*	*32,964.8*	*34,613.0*
Video	-	*3,400.0*	*4,760.0*	*5,600.0*	*6,640.0*	*8,340.0*	*10,091.4*	*11,403.3*	*12,543.6*	*13,798.0*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (RUB mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	6,923.0	9,155.0	12,855.2	18,465.0	24,854.4	29,107.1	33,037.5	35,632.5
Banners + other traditional display	-	-	*6,685.0*	*8,595.0*	*11,660.0*	*16,380.0*	*21,827.0*	*25,116.0*	*28,020.0*	*30,113.3*
Video	-	-	*238.0*	*560.0*	*1,195.2*	*2,085.0*	*3,027.4*	*3,991.1*	*5,017.4*	*5,519.2*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (RUB mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	6,646.1	8,239.5	11,441.1	15,141.3	19,137.9	20,957.1	23,126.2	24,942.7
Private marketplaces	-	-	138.5	274.7	385.7	738.6	994.2	1,164.3	1,651.9	1,781.6
Preferred deals	-	-	138.5	640.9	899.9	1,661.9	2,236.9	2,619.6	3,303.7	3,563.2
Guaranteed	-	-	0.0	0.0	128.6	923.3	2,485.4	4,366.1	4,955.6	5,344.9

Top five buy side technology in market

1. DV360 by Google
2. Yandex
3. MyTarget by Mail.ru Group
4. Criteo
5. Getintent

Top five sell side vendors in market

1. Yandex (AdFox)
2. Google Ad Manager
3. Mail.ru Group
4. Between
5. Criteo

Source: AKAR, IAB Russia, Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	1.07	0.71	0.74	0.56	0.70	1.12	1.02
Display	1.07	0.73	0.75	0.54	0.71	1.13	0.94
Mobile	1.07	0.73	0.29	0.50	0.58	0.80	0.81
Video	0.82	0.77	4.02	3.25	5.88	1.58	3.02
Social	-	-	-	-	-	-	-

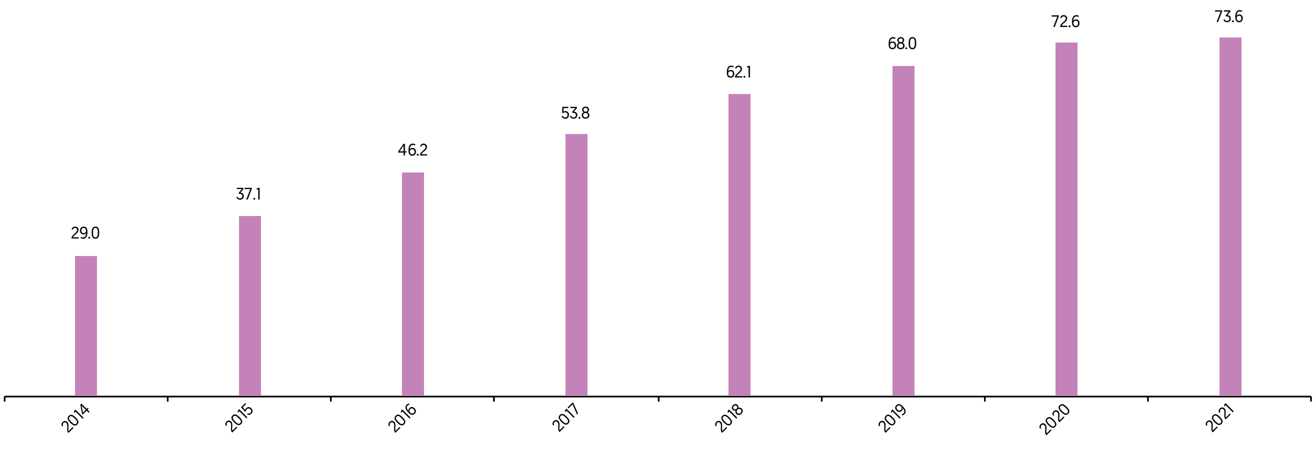
Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.82	0.47	0.81	0.56	0.82	1.02	0.73
Display	0.82	0.77	1.11	0.62	0.92	1.07	0.80
Mobile	0.82	0.77	0.08	0.24	0.39	0.70	0.35
Video	-	0.15	0.14	0.83	3.53	0.83	1.13
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.13	0.15	0.09	0.10	0.09	0.11	0.14
Display	0.13	0.10	0.07	0.09	0.08	0.11	0.12
Mobile	0.13	0.10	0.37	0.21	0.15	0.11	0.23
Video	0.13	0.10	2.81	0.39	0.17	0.19	0.27
Social	-	-	-	-	-	-	-

Programmatic share of display advertising spend (%)



Programmatic technologies are well developed in Russia. Different DSPs, including local players, actively compete with each other. Some established local DSP products are entering the global market. The only remaining underdeveloped area is traffic verification, for which international tools are currently used.

Programmatic is rapidly growing in Russia. Advertisers are paying more and more attention to the channel and wish to exploit new opportunities to make use of first-party and other data. 'Data-driven' marketing is of interest to everyone, and programmatic provides a well-developed infrastructure for its implementation. It also offers an opportunity to small advertisers to enter the market since entry costs are relatively low. In general, programmatic buying is already significantly bigger than traditional reserved buying.

Full-service DSPs are very popular on the market, but are often used for arbitrage instead of programmatic sales as such. Top players provide self-service solutions that are used either directly or in a mix with other DSPs.

It is common practice for publishers to use several programmatic solutions from different vendors simultaneously, sometimes competing ones. Publishing houses and local publishers are the main players on the market. We expect to see more header bidding and some consolidation on the publisher side over the next few years, which should improve efficiency in the market, and also allow advertisers to increase share of deal buying, swapping to more brand safe and better quality traffic.

Publishers and agencies have high levels of knowledge about programmatic trading, but advertisers are polarised. Some have deep knowledge, while others are just starting to pay attention. The growth of the market means that specialists are in demand.

Open deals are the most popular, while preferred and guaranteed deals are more popular than private marketplaces.

Broadcasters and contractors are just making their first attempts to sell TV and outdoor programmatically, and we expect to see more of this in 2020.

The most important barrier to progress is the lack of a unified approach to measuring all the different digital and programmatic platforms. We are looking forward to the development of more advanced analytics and attribution tools to overcome this.

Serbia

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	12.0	14.3	17.4	20.3	21.5	26.0	32.5	36.5	40.0	44.0
Total display	10.4	11.9	13.9	14.8	17.5	21.2	25.9	31.0	35.7	41.0
Banners + other traditional display	*9.9*	*11.3*	*13.2*	*14.1*	*15.8*	*17.0*	*20.7*	*24.2*	*26.8*	*29.5*
Video	*0.5*	*0.6*	*0.7*	*0.7*	*1.8*	*4.1*	*5.0*	*6.3*	*8.1*	*10.5*
Native	-	-	-	-	-	*0.1*	*0.2*	*0.5*	*0.8*	*1.0*

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	5.3	7.0	10.0	15.4	19.0	22.2	25.1
Banners + other traditional display	-	-	-	-	-	-	*13.4*	*16.5*	*18.7*	*20.7*
Video	-	-	-	-	-	-	*1.9*	*2.5*	*3.4*	*4.4*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	-	-	-	-	14.6	17.1	18.8	21.3
Other	-	-	-	-	-	-	0.8	1.9	3.3	3.8

Top five sell side vendors in market

1 Ringier Axel Springer
2 Adria Media Group
3 Telegraf
4 Antena
5 Infostud

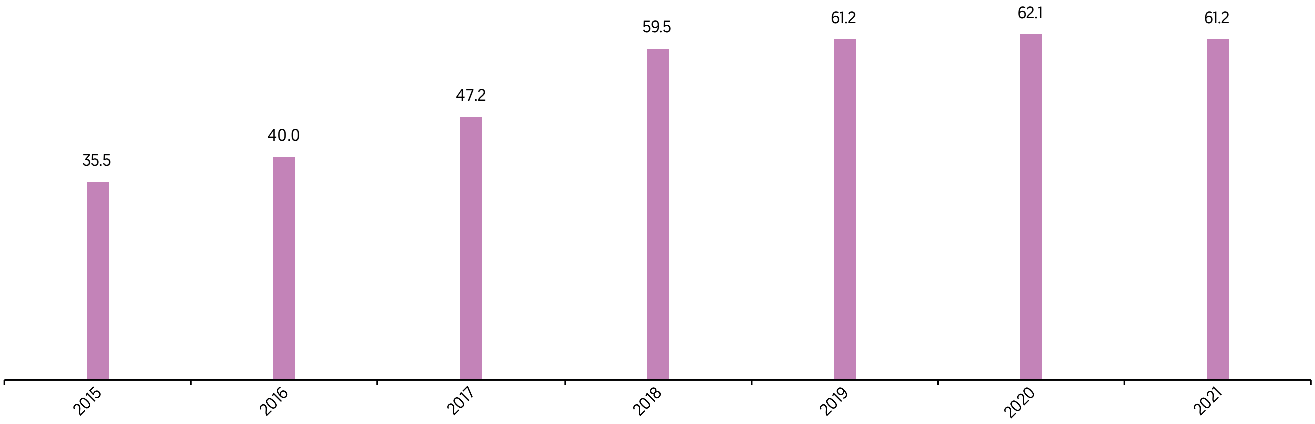
Source: Zenith

Programmatic spend - emerging media channels (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Newspapers	-	-	-	-	-	-	-	-	-	-
Magazines	-	-	-	-	-	-	-	-	-	-
TV	-	-	-	-	-	-	-	-	-	-
Radio	-	-	-	-	-	-	-	-	-	-
Cinema	-	-	-	-	-	-	-	-	-	-
Out-of-home	-	-	-	-	-	-	-	-	0.01	0.05

Source: Zenith

Programmatic share of display advertising spend (%)



There is no local programmatic technology in Serbia. Providers from Western Europe offer programmatic sales of some local web inventory, but there is plenty of room for improvement, for example local publishers opening up their premium inventory to programmatic buying. Most growth at the moment is generated from targeted ads on Google and Facebook platforms.

Self-service has become more popular and now accounts for 90% of targeted ads.

The programmatic market is still underdeveloped, with only basic knowledge among agencies and advertisers.

Trades are normally via open bidding, although preferred and guaranteed deals play a role.

Local publishers are more and more open to programmatic buying, but the biggest obstacle is the lack of relevant local data about user behaviour in Serbia. Once agencies and clients have this data they will be much more motivated.

Adoption within traditional media channels is sparse; there are some OOH indoor technologies that use real time data as a base for targeted ads.

Slovakia

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	35.0	58.0	76.0	91.0	112.0	126.0	140.0	155.0	175.0	200.0
Total display	35.0	40.0	45.0	44.7	57.9	73.6	79.3	82.1	83.5	86.3
Banners + other traditional display	*35.0*	*40.0*	*45.0*	*36.0*	*44.0*	*51.0*	*53.0*	*54.0*	*54.0*	*55.0*
Video	-	-	-	*8.0*	*13.0*	*19.6*	*22.2*	*23.0*	*24.0*	*25.0*
Native	-	-	-	*0.7*	*0.9*	*3.0*	*4.1*	*5.1*	*5.5*	*6.3*

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	1.0	3.0	6.0	10.0	14.0	20.0	23.7	26.6
Banners + other traditional display	-	-	*1.0*	*2.4*	*5.2*	*9.0*	*12.8*	*18.6*	*20.5*	*22.0*
Video	-	-	-	*0.6*	*0.8*	*1.0*	*1.2*	*1.4*	*2.2*	*3.0*
Native	-	-	-	-	-	-	-	-	*1.0*	*1.6*

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	1.0	3.0	6.0	8.7	12.0	16.5	18.2	19.3
Private marketplaces	-	-	0.0	0.0	0.0	1.0	1.4	2.0	2.5	3.2
Preferred deals	-	-	0.0	0.0	0.0	0.3	0.6	1.0	2.0	2.4
Guaranteed	-	-	0.0	0.0	0.0	0.0	0.0	0.5	1.0	1.7

Top five buy side technology in market

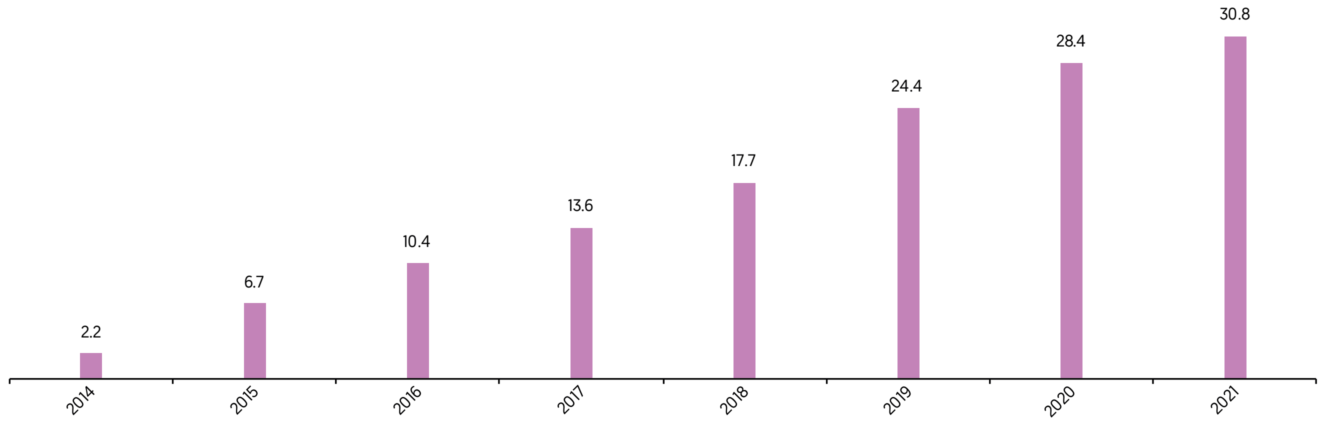
1	Adform
2	Display and Video 360
3	RTB House
4	Criteo
5	Sociomantic

Top five sell side vendors in market

1	Google Ad Manager
2	iBillboard
3	Pubmatic
4	Smart RTB+
5	Rubicon

Source: IAB Slovakia, Zenith

Programmatic share of display advertising spend (%)



Almost all main publishers have implemented an SSP (normally GFA or Adform) and run yield management. Income share from programmatic is starting to play an important role for their businesses. Preferred deals are available, though most campaigns are run through open auction (RTB).

When publishers start to offer additional services/value – data, for example – the trend is to use managed-service.

Global clients are now demanding programmatic buys, and both agencies and publishers have had to adapt to this. They have adopted technology, strategy and know-how for programmatic. Experience of programmatic purchases is now available to local clients as added value.

The vendor Adform is the leading provider of knowledge about programmatic techniques, followed by international agencies.

In terms of barriers to growth, clients are not yet ready to migrate their CRM data onto DMPs, and there is a scarcity of third-party data.

Slovakia is very small market, and while programmatic is useful for small and medium advertisers with small budgets, we expect direct deals to be the preference for the biggest advertisers over the next five years.

There is currently no programmatic trading of traditional media, although it is possible this will change once online programmatic has become more established.

South Africa

Top buy side technology in market

1 DV360
2 TheTradeDesk
3 MediaMath

Top five sell side vendors in market

1 Google Ad Manager
2 AppNexus
3 Rubicon
4 BidSwitch
5 Brightroll

Programmatic is changing the way digital media is bought in South Africa. It is cutting out the middle men and improving efficiency, and this will continue over the next few years.

DMP usage is very limited, but there are lots of global ad exchanges in the market: Google Ad Exchange, AppNexus, Rubicon, Improve Digital, Brightroll, BidSwitch, AdForm, OpenX, TeadsTV, TripleLift and Waze. SSPs are similar, while DSPs include DV360, TheTradeDesk and Mediamath.

There is still a general lack of knowledge, but it has been improving over the past two years. However, growth in programmatic has been strong as there is a tendency to centralise advertising efforts. One of the barriers to growth is getting a suitable budget to support a good campaign.

Publishers are swiftly moving to optimise their unsold inventory and automate the sales process. The most common types of deal used in the South African market are private auction, preferred and, to a lesser extent, programmatic guaranteed.

Within traditional media channels, audio has been available to buy programmatically since early 2019, and streaming TV will be available in 2020. There has been no major movement yet for OOH.

Forecasts

Advertising spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	885.7	878.4	1,065.6	1,288.9	1,565.6	1,708.0	1,971.9	2,169.1	2,429.4	2,672.3
Total display	391.7	360.0	463.6	598.2	742.7	785.0	950.0	1,025.1	1,121.9	1,265.1
Banners + other traditional display	*391.7*	*360.0*	*392.1*	*474.0*	*584.1*	*608.2*	*695.9*	*730.7*	*781.8*	*860.0*
Video	-	-	*71.5*	*124.2*	*158.6*	*176.8*	*211.0*	*242.7*	*280.6*	*336.7*
Native	-	-	-	-	-	-	*43.1*	*51.7*	*59.5*	*68.4*

Programmatic spend (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	52.1	50.7	86.4	133.7	155.7	275.3	319.5	376.6	447.8
Banners + other traditional display	-	-	*41.4*	*65.7*	*104.3*	*128.8*	*217.1*	*249.7*	*292.1*	*344.7*
Video	-	-	*9.3*	*20.6*	*29.4*	*26.9*	*58.2*	*69.8*	*84.5*	*103.1*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (€ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	52.1	21.9	30.3	40.1	47.2	104.6	121.4	128.0	170.2
Private marketplaces	-	0.0	17.2	35.4	41.4	47.5	44.0	51.1	49.0	71.6
Preferred deals	-	0.0	7.6	13.8	38.8	45.6	82.6	83.1	105.5	134.3
Guaranteed	-	0.0	4.1	6.9	13.4	15.4	44.0	63.9	94.2	71.6

Top five buy side technology in market

1	DV360
2	Appnexus
3	Amazon
4	TTD
5	Adobe Ad Cloud

Top five sell side vendors in market

1	Doubleclick Ad Ex
2	TeadsTV
3	Appnexus
4	SpotX
5	SmartRTB+

Source: IAB, Zenith
Note: The adspend figures from the IAB are somewhat different from those used in our Advertising Expenditure Forecasts, which are supplied by Infoadex. We use the IAB figures in this report because they are segmented in a more suitable manner for looking at programmatic marketing.

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.96	2.37	4.03	3.20	4.73	4.50	3.93
Display	0.96	0.79	1.23	1.39	2.50	3.18	2.30
Mobile	0.96	0.79	-	-	4.28	4.57	3.95
Video	0.88	1.05	8.22	9.45	9.66	10.20	10.05
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.88	0.61	0.79	0.84	0.86	1.30	0.77
Display	0.88	1.05	1.20	1.64	1.02	1.74	1.70
Mobile	0.88	1.05	-	-	1.67	1.98	-
Video	0.00	0.53	0.74	0.67	0.78	1.02	0.42
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

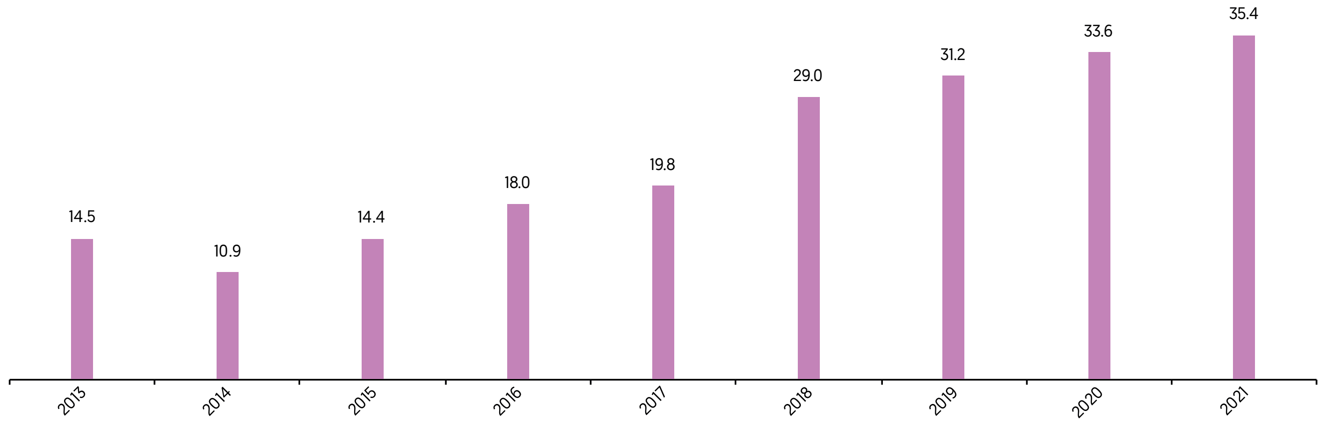
	2012	2013	2014	2015	2016	2017	2018
Overall	0.11	0.39	0.51	0.38	0.55	0.24	0.28
Display	0.11	0.07	0.10	0.08	0.24	0.16	0.16
Mobile	0.11	0.07	-	-	0.26	0.32	0.39
Video	0.11	0.07	1.11	1.41	1.24	1.18	1.66
Social	-	-	-	-	-	-	-

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	52.0	57.5

Source: Zenith estimates

Programmatic share of display advertising spend (%)



Programmatic share of investment is thought to stand at around 31% in Spain, where it is used most heavily by advertisers in categories such as telecommunications, finance, insurance and automotive. DMPs, SSPs, header bidding, and DSPs are very common and advertisers, agencies and publishers are becoming tech and data companies more and more. Direct buying continues to exist in our market but its share is going down each year. Only special actions such as brand days, branded content, special creatives and so on continue to use direct buying.

Programmatic advertising is more efficient for both advertisers and publishers. Advertisers are investing more and programmatic spend is growing at double-digit rates. In some categories (such as telecommunications and automotive) it accounts for over 60%-70% of advertisers' display and video budgets.

There is still a lot of work to be done to address advertisers' concerns about brand safety, fraud and viewability.

Nowadays, preferred deals are the most used deals in programmatic advertising. However, the use of guaranteed deals is growing and in the medium term we could see them overtaking preferred.

Digital radio channels and addressable TV are already sold programmatically. The main outdoor contractors are taking steps to digitalise and categorise their inventory; selling it programmatically will be the next step.

Sweden

Forecasts

Advertising spend (SKr mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	7,689.2	8,232.1	10,795.5	12,981.3	15,800.8	19,052.2	21,435.7	23,421.8	26,130.2	28,947.1
Total display	2,583.0	2,762.6	3,784.5	4,296.8	4,687.2	5,098.4	5,445.9	5,729.1	6,188.0	6,749.0
Banners + other traditional display	*2,295.1*	*2,350.5*	*3,136.5*	*3,374.6*	*3,544.6*	*3,580.3*	*3,643.5*	*3,663.2*	*3,687.0*	*3,847.0*
Video	*287.9*	*412.1*	*648.0*	*922.2*	*1,142.6*	*1,518.1*	*1,802.4*	*2,066.0*	*2,501.0*	*2,902.0*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (SKr mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	310.0	690.0	1,370.0	1,860.0	2,220.0	2,800.0	3,300.0	3,600.0
Banners + other traditional display	-	-	*200.0*	*440.0*	*960.0*	*1,250.0*	*1,420.0*	*1,830.0*	*2,110.0*	*2,268.0*
Video	-	-	*110.0*	*250.0*	*400.0*	*570.0*	*800.0*	*945.0*	*1,190.0*	*1,332.0*
Native	-	-	-	-	-	-	-	-	-	-

Top buy side technology in market

1. Google Display & Video 360
2. Adform
3. Appnexus
4. Mediamath
5. Delta

Top five sell side vendors in market

1. Schibsted
2. Bonnier
3. Microsoft
4. Leeds
5. Keymobile

Source: IRM, Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	1.44	0.81	1.68	3.81	7.48	10.60	7.01
Display	1.44	0.81	1.17	2.47	-	7.62	6.53
Mobile	1.44	0.81	-	-	-	7.40	-
Video	2.86	1.33	-	-	15.85	16.89	7.10
Social	-	-	-	-	-	-	-

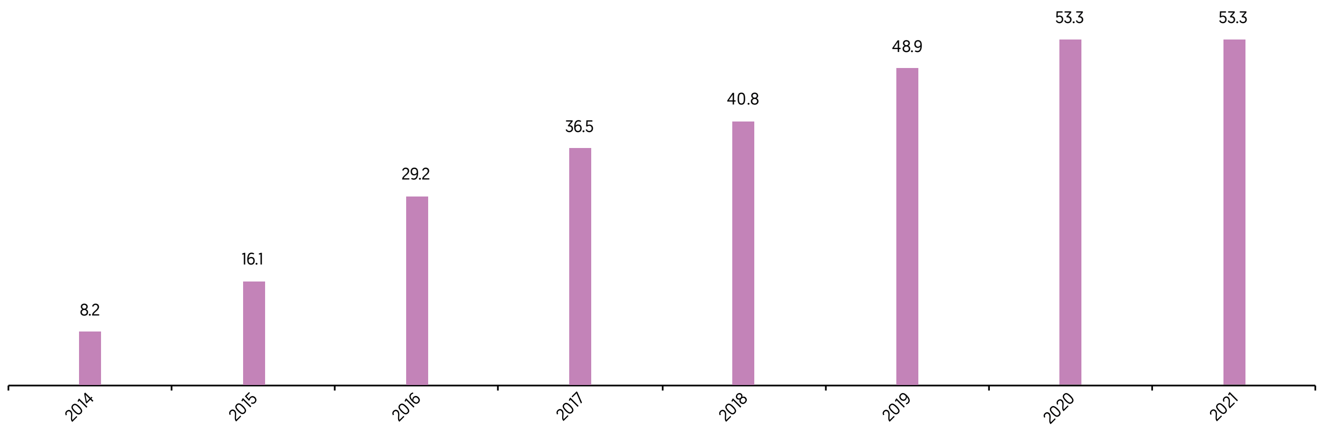
Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	2.86	1.33	1.62	2.81	4.71	5.17	5.71
Display	2.86	1.33	2.52	2.16	-	4.73	6.22
Mobile	2.86	1.33	-	-	-	4.56	-
Video	-	1.56	-	-	4.03	5.69	5.63
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.05	0.06	0.10	0.14	0.16	0.21	0.12
Display	0.05	0.06	0.05	0.11	-	0.16	0.10
Mobile	0.05	0.06	-	-	-	0.16	-
Video	0.05	0.06	-	-	0.39	0.30	0.13
Social	-	-	-	-	-	-	-

Programmatic share of display advertising spend (%)



Programmatic infrastructure is working more smoothly in Sweden as the market matures. Google's DV360 and Adform are the main DSPs, whereas Campaign Manager is the primary ad server, followed by Adform. The top exchanges are Rubicon, Google Ad Manager, AppNexus, FreeWheel and SpotXchange.

Publishers are selling more of their inventory programmatically, especially online video, which previously had limited programmatic inventory. Moreover, client managers as well as clients themselves are more aware of programmatic trading and more confident in allocating budgets to it.

Some publisher-owned data can only be applied on reservation bookings, so campaigns targeting certain target groups may have to be bought directly rather than programmatically. Likewise, some campaigns with short flights or during periods with high competition (such as Christmas) may need to be reserved directly beforehand in case the required inventory sells out.

There is still a lack of knowledge outside the agency world, though knowledge has improved over the last few years. Agencies need to lead the education of clients and colleagues, while vendors need to take the lead on supply-side technology.

Private Auction/Private Market Place deals are the most common ones. However, there has been an increase in Guaranteed deals.

The publishers are more eager than previously to respond to the programmatic demand from buyers and overcome any technical barriers between the supply and demand sides. Moreover, more publisher-owned data is becoming available programmatically.

No traditional media channels are currently available programmatically, though there are ongoing discussions within the industry about the possibility.

Switzerland

Forecasts

Advertising spend (SF mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	674.4	743.7	848.3	1,012.0	1,135.0	1,279.0	1,440.0	1,631.0	1,831.0	1,966.5
Total display	170.0	186.0	210.0	259.0	268.0	283.0	291.0	315.0	350.0	380.0
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (SF mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	4.2	15.5	34.8	73.4	130.7	176.5	227.7	273.2
Banners + other traditional display	-	-	*4.2*	*13.2*	*20.2*	*41.9*	*70.6*	*91.8*	*119.8*	*136.6*
Video	-	-	*0.0*	*2.3*	*14.6*	*30.8*	*57.5*	*74.1*	*91.1*	*109.3*
Native	-	-	*0.0*	*0.0*	*0.0*	*0.7*	*2.6*	*10.6*	*16.8*	*27.3*

Programmatic spend by type of deal (SF mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	3.4	1.6	3.5	7.3	13.1	19.4	29.6	35.5
Private marketplaces	-	-	0.8	9.3	15.7	33.1	57.5	75.9	95.6	114.8
Preferred deals	-	-	0.0	4.7	15.3	29.4	52.3	70.6	88.8	106.6
Guaranteed	-	-	0.0	0.0	0.3	3.7	7.8	10.6	13.7	16.4

Top buy side technology in market

1	DV360
2	Appnexus
3	Adform
4	DataXu

Top five sell side vendors in market

1	Appnexus
2	Google AdExchange
3	Improve Digital
4	TeadsTV
5	Pubmatic

Source: Media Focus, Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	1.07	3.41	10.65	33.96	25.47	22.93
Display	-	1.07	6.26	12.74	25.27	17.69	16.80
Mobile	-	1.07	-	-	18.17	14.54	13.81
Video	-	2.00	-	-	54.05	43.24	25.94
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	2.00	4.64	8.81	12.99	-	-
Display	-	2.00	5.35	8.45	-	-	-
Mobile	-	2.00	-	-	-	-	-
Video	-	-	-	-	-	-	-
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

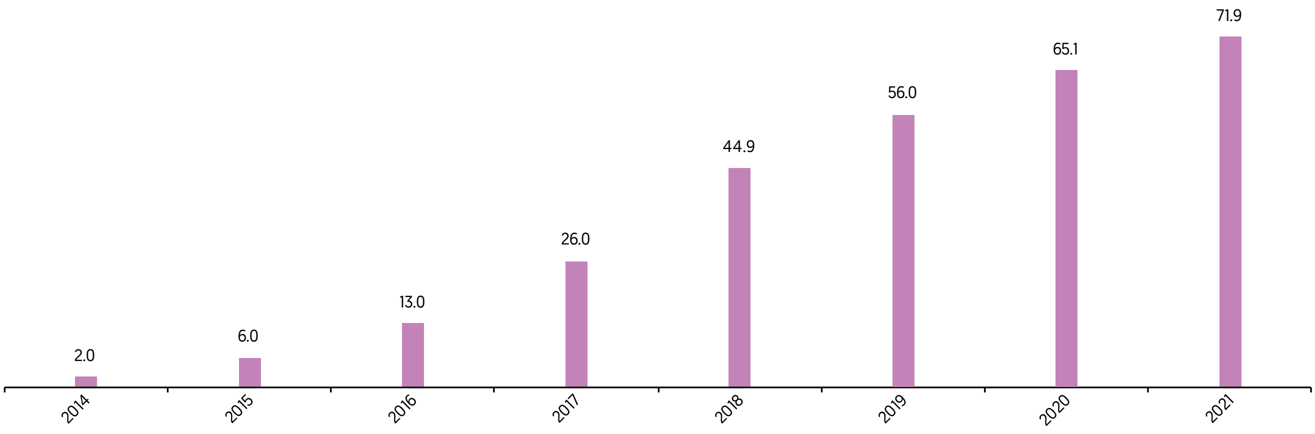
	2012	2013	2014	2015	2016	2017	2018
Overall	-	0.05	0.07	0.12	0.26	0.22	0.20
Display	-	0.05	0.12	0.15	0.10	0.12	0.09
Mobile	-	0.05	-	-	0.25	0.20	0.22
Video	-	0.05	-	-	0.35	0.30	0.28
Social	-	-	-	-	-	-	-

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	80.00	60.00	50.00

Source: Zenith estimates

Programmatic share of display advertising spend (%)



Programmatic marketing is developing quite quickly in Switzerland. It started at the end of 2014 with some publishers opening up programmatic sales and discussing this with agencies and clients. Because the publishers were scared of price erosion, most focused on private marketplace deals. This went down well with clients, who demand premium Swiss traffic instead of low-quality cross-border traffic.

After an initial spurt of growth, open RTB buying never really took off in Switzerland. Private deals are the most common type, followed by preferred deals. Automated guaranteed deals have been tested, but are still hardly used and most publishers do not offer them.

Ad networks are in a difficult situation, and only those that are developing transparent programmatic products have potential for future growth. Agency self-service buying and publisher self-service selling are becoming common-place. Managed service through technology providers is hardly used on either the sell or the buy side.

Most of the bigger international SSPs and DSPs are used in the Swiss market. Various national and international partners offer data services.

Programmatic is one of the most discussed topics in digital marketing and there is a high demand for knowledge. There are still very few specialists and knowledge is one of the most scarce resources in the market.

There have been discussions about adapting programmatic techniques for other media, and tests are being conducted for radio and TV.

Taiwan

Forecasts

Advertising spend (NT$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	11,601.0	13,680.0	16,177.0	19,352.0	25,871.0	33,097.0	38,966.0	42,000.0	44,440.5	46,507.8
Total display	8,120.7	8,892.0	11,470.0	13,749.0	19,711.0	25,177.0	29,454.0	32,012.4	34,103.3	35,860.5
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (NT$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	-	6,726.0	9,565.0	11,806.7	13,611.4	15,207.0	16,234.2
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Top buy side technology in market

1 DV360
2 Verizon
2 TTD

Top sell side vendors in market

1 DoubleClick Ad Exchange
2 ONE by AOL(Yahoo)
3 PubMatic
4 Index Exchange
5 OpenX

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.51	0.61	1.13	0.83	2.26
Display	-	-	0.53	0.58	0.73	0.74	1.05
Mobile	-	-	0.22	0.30	0.98	1.37	0.06
Video	-	-	-	7.30	8.17	9.03	7.43
Social	-	-	-	-	-	-	-

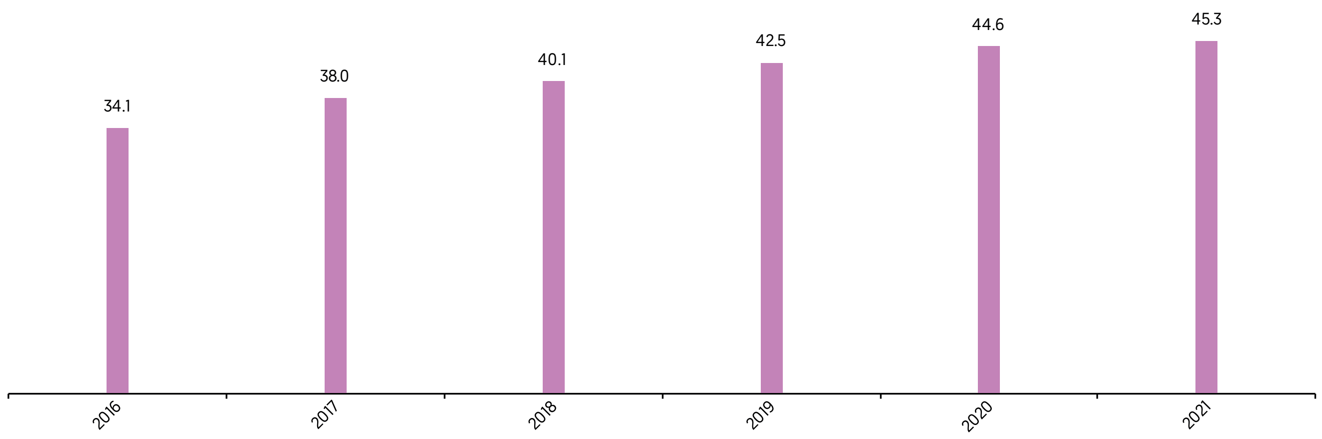
Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	1.28	0.49	1.02	0.57	0.97
Display	-	-	1.84	0.50	0.75	0.68	1.22
Mobile	-	-	0.09	0.16	1.40	1.30	0.01
Video	-	-	-	0.54	2.33	0.23	0.86
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.04	0.12	0.11	0.15	0.23
Display	-	-	0.03	0.12	0.10	0.11	0.09
Mobile	-	-	0.25	0.19	0.07	0.11	0.67
Video	-	-	-	1.34	0.35	3.86	0.86
Social	-	-	-	-	-	-	-

Programmatic share of display advertising spend (%)



Google Campaign Manager is still the leading ad server; Sizmek's market status is still not clear after its acquisition by Amazon. GA 360 is the dominant DMP, followed by Oracle (Bluekai) and Adobe Audience Manager. Google Ad Manager (Doubleclick Ad Exchange) and Verizon are the main exchanges. 90% of publishers use Google Ad Manager, so DFP – its SSP – is by far the leading SSP. DV360 is the dominant DSP while TTD is still struggling to gain more market share.

Video is driving growth in demand, especially out-stream and in-banner video formats. DDC (Data Driven Creative) is becoming more mature as, for example, the combination of dynamic versioning and signal data makes it easier for advertisers to adopt it and, by extension, programmatic buying.

Multinational agencies normally prefer self-service to meet their clients' needs for transparency and full control of inventory, while clients will often use managed service for its valuable data.

Google and Verizon are leading education in programmatic technology in Taiwan, while some agencies also conduct in-house education, so marketers are becoming more knowledgeable. Planners are more fluent in programmatic strategy but most are still in the early stages of supply optimisation.

Open exchange is common, but agencies are becoming more open to PMP (Private Market Place) deals.

The main reason for publishers to adopt programmatic trading is to increase fill rates and CPMs.

Google Ad Manager (DFP), which is used by 90% of publishers in Taiwan, is shifting to first-price auction, which is encouraging more marketers to use ad exchanges.

Strict regulation limits the opportunities for addressable TV to grow in Taiwan. The technology exists to allow DOOH (digital out-of-home) to be traded programmatically, but ownership is fragmented and complex, which makes vendors' inventory hard to scale. Therefore programmatic DOOH will take some time to realise. Radio is another medium with potential for programmatic buying, since the online streaming platforms like Spotify and KKBOX already offer programmatic trading of their audio inventory.

Top five buy side technology in market

1	DBM
2	TTD
3	Adobe
4	Innity
5	Vserv

Top five sell side vendors in market

1	DBM
2	TTD
3	Adobe
4	Innity
5	Vserv

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.37	0.41	1.45	1.81	2.19
Display	-	-	0.37	0.41	0.77	1.26	2.19
Mobile	-	-	-	-	-	-	-
Video	-	-	-	-	5.54	4.67	-
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.70	0.44	1.06	1.20	1.80
Display	-	-	0.70	0.44	0.75	1.06	1.80
Mobile	-	-	-	-	-	-	-
Video	-	-	-	-	1.63	1.45	-
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	0.05	0.09	0.14	0.15	0.12
Display	-	-	0.05	0.09	0.10	0.12	0.12
Mobile	-	-	-	-	-	-	-
Video	-	-	-	-	0.34	0.32	-
Social	-	-	-	-	-	-	-

Programmatic trading has been adopted enthusiastically in Thailand. Every agency has its own programmatic offering, and competition is high. Google has a full suite of programmatic tools under Google Marketing Platform.

Programmatic trading is being pushed by agencies and international vendors, including big publishers like Google and Facebook. Clients are becoming better educated in the details.

Most agencies use self-service, because of its high flexibility and cost efficiency. Managed service is normally used for vendors that have third-party data or strong publisher networks like Adara or TTD.

Programmatic trading of traditional media is still in a very early stage. Some publishers like VGI are trying to promote their buying methods for out-of-home as programmatic, but they do not offer the full range of benefits.

Some clients are finding that the ROI of their programmatic activity is lower than they expected, with poorer conversions. This is probably because it can be difficult to get the right data to execute programmatic campaigns. Data partners and vendors need to improve the supply of data, without which programmatic will fail to deliver to clients the quality and efficiency they need.

Turkey

Forecasts

Advertising spend (Turkish Lira mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	421.0	494.8	1,182.0	1,484.0	1,736.0	2,077.0	2,385.0	2,671.2	3,135.1	3,730.8
Total display	379.8	446.0	507.0	600.0	738.0	1,265.0	1,438.2	1,610.7	1,890.5	2,249.7
Banners + other traditional display	*329.8*	*371.0*	*387.0*	*421.0*	*501.0*	*916.9*	*951.7*	*1,044.4*	*1,224.5*	*1,417.3*
Video	*50.0*	*75.0*	*100.0*	*134.0*	*179.0*	*269.5*	*399.4*	*470.2*	*552.3*	*674.9*
Native	-	-	*20.0*	*45.0*	*58.0*	*78.6*	*87.1*	*96.1*	*113.7*	*157.5*

Programmatic spend (Turkish lira mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	-	-	20.0	58.0	515.0	970.0	1,110.0	1,235.0	1,529.8
Banners + other traditional display	-	-	-	*15.0*	*50.0*	*450.0*	*655.0*	*720.0*	*760.0*	*917.9*
Video	-	-	-	*3.0*	*5.0*	*55.0*	*270.0*	*340.0*	*405.0*	*520.1*
Native	-	-	-	*2.0*	*3.0*	*10.0*	*45.0*	*50.0*	*70.0*	*91.8*

Programmatic spend by type of deal (Turkish lira mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	-	17.0	41.0	258.0	420.0	445.0	460.0	535.4
Private marketplaces	-	-	-	0.0	0.0	0.0	20.0	35.0	50.0	76.5
Preferred deals	-	-	-	3.0	12.0	155.0	320.0	380.0	415.0	504.8
Guaranteed	-	-	-	0.0	6.0	103.0	210.0	250.0	310.0	413.0

Top five buy side technology in market

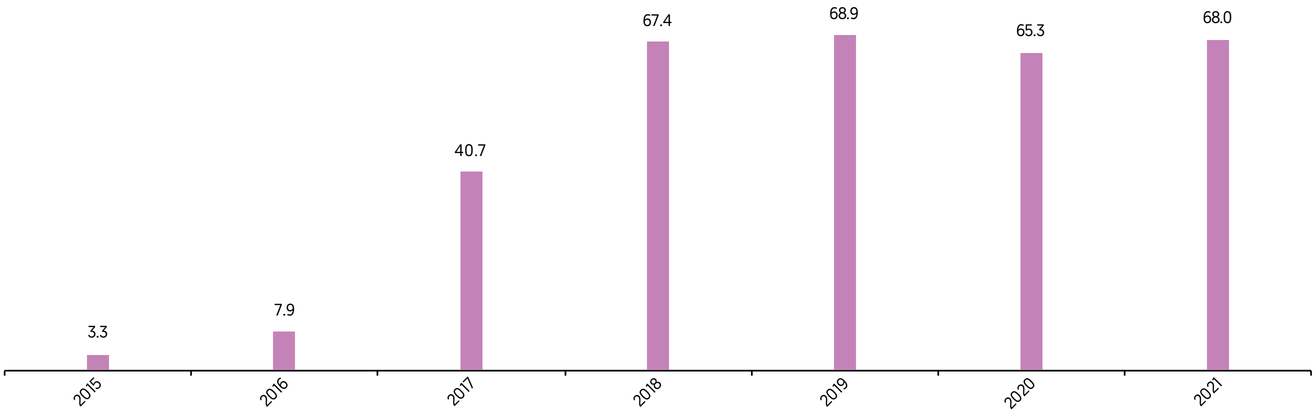
1	Google
2	Adform
3	Mediamath
4	AppNexus
5	Dataxu

Top five sell side vendors in market

1	Google Adex
2	BidSwitch
3	Adform
4	AppNexus
5	OpenX

Source: Zenith

Programmatic share of display advertising spend (%)



Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	1.76	0.88	0.55	0.83	1.62	1.66
Display	-	1.73	0.85	0.48	0.60	1.21	1.13
Mobile	-	1.73	0.79	0.38	0.44	0.90	1.27
Video	-	0.31	7.24	6.34	6.80	2.75	2.87
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	0.31	0.61	0.36	0.69	0.53	0.67
Display	-	0.31	0.88	0.69	1.01	1.14	0.86
Mobile	-	0.31	0.36	0.19	0.33	0.48	0.45
Video	-	0.16	0.20	0.13	0.85	0.41	0.69
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	0.57	0.14	0.16	0.12	0.30	0.25
Display	-	0.56	0.10	0.07	0.06	0.11	0.13
Mobile	-	0.56	0.22	0.20	0.13	0.19	0.28
Video	-	0.56	3.59	4.70	0.80	0.66	0.41
Social	-	-	-	-	-	-	-

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	32.0	35.0	42.0	47.0

Source: Zenith estimates

In Turkey, Google dominates the programmatic landscape. The market is mature, but there has been growth as e-retailers try to make more use of programmatic. The main barrier to growth is the walled garden between tech vendors and local support.

Agencies and vendors lead programmatic education in the market; marketers have knowledge, but they don't have any solid practice.

A lack of knowledge and experienced employees is blocking use of self-service. The deals between publishers and trading desks are another reason for the wide use of managed service.

In terms of deals used, guaranteed is on the rise after first price auction was introduced to the market. Header bidding and first price auction are providing the most important drive for programmatic among publishers.

The adoption of programmatic buying methods in traditional media channels is in its early stages. Programmatic TV is still only used as an innovative project.

Forecasts

Advertising spend (UAH mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	670.0	2,000.0	2,150.0	2,365.0	3,100.0	4,300.0	5,600.0	6,720.0	7,764.0	9,677.0
Total display	-	1,040.0	1,075.0	1,275.0	1,800.0	2,400.0	3,200.0	4,020.0	4,700.0	5,760.0
Banners + other traditional display	-	*840.0*	*870.0*	*950.0*	*1,288.9*	*1,602.2*	*1,474.3*	*1,558.1*	*1,645.0*	*1,728.0*
Video	-	*200.0*	*205.0*	*325.0*	*511.1*	*797.8*	*1,725.7*	*2,461.9*	*3,055.0*	*4,032.0*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (UAH mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	-	20.8	32.3	61.2	174.6	360.0	800.0	1,407.0	2,115.0	3,052.8
Banners + other traditional display	-	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-	-
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend by type of deal (UAH mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open [RTB]	-	20.8	32.3	61.2	174.6	360.0	800.0	1,407.0	2,115.0	3,052.8
Private marketplaces	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preferred deals	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guaranteed	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Top five buy side technology in market (2017)

1	DoubleClick Bid Manager
2	RTB Media
3	C8
4	Programmatic Media/Get Intent
5	Admixer DSP

Top five sell side vendors in market (2017)

1	Google/ADX [ADX]
2	AdMixer [bsw.admixer]
3	OpenX [BSW]
4	Begun
5	Smaato

Source: Ukrainian AdCoalition, Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	0.44	0.48
Display	-	-	-	-	-	0.35	0.42
Mobile	-	-	-	-	-	0.64	0.56
Video	-	-	-	-	-	1.96	1.94
Social	-	-	-	-	-	-	-

Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	0.23	0.33
Display	-	-	-	-	-	0.37	0.54
Mobile	-	-	-	-	-	0.16	0.24
Video	-	-	-	-	-	0.15	0.34
Social	-	-	-	-	-	-	-

Average programmatic CTR by media channel (%)

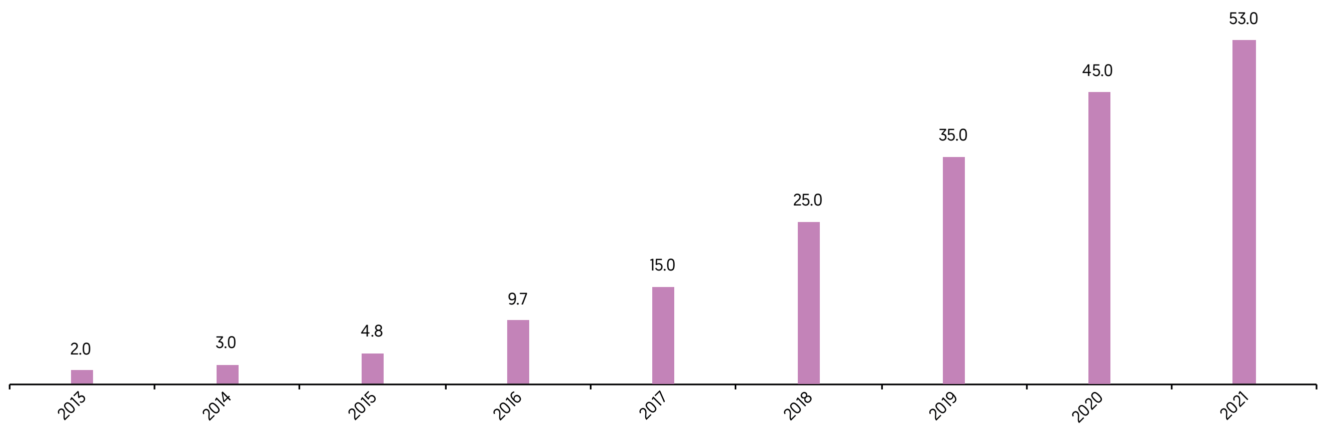
	2012	2013	2014	2015	2016	2017	2018
Overall	-	-	-	-	-	0.19	0.15
Display	-	-	-	-	-	0.10	0.08
Mobile	-	-	-	-	-	0.40	0.23
Video	-	-	-	-	-	1.33	0.58
Social	-	-	-	-	-	-	-

Completion rate by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Video	-	-	-	-	-	15.09	26.64

Source: Zenith estimates

Programmatic share of display advertising spend (%)



DV360 is still the leading supplier, and most competitors sell Google's inventory via different DSPs. Admixer TradeDesk is mainly used to buy local inventory with programmatic benefits.

Growth in programmatic spending is being driven by new instruments and technologies (buying methods, audience targeting, TV Sync etc.), its ability to reach a narrow target audience, the improving quality of inventory, and wide opportunities for optimization.

Most programmatic buying is done with self-service. Direct reservations are used if necessary to purchase specific sites that can't be bought through programmatic deals.

Quite a lot of programmatic training has been conducted recently, particularly by Google and Admixer.

Basically all programmatic trading is open marketplace RTB. Advertisers and agencies are keen to make use of private deals, but these are not available from publishers.

Some DSPs have presented TV Sync – technology based on listening to TV broadcasts and launching digital advertising at the time the video is shown on TV. These are the first steps to synchronising traditional media channels with digital through programmatic technology.

Payments previously had to be made in US dollars, which was difficult for many local companies. The ability to trade in local currency is opening the market to new entrants.

Ukrainians are becoming more educated about automated advertising. Programmatic trading is being treated more as a strategic tool of media planning. Key drivers of growth for the future will be: sync with other media, programmatic deals, new DMPs, brand safety and inventory quality.

United Kingdom

Forecasts

Advertising spend (£ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	5,551.0	6,357.0	7,451.0	8,988.0	10,230.0	11,533.0	13,356.0	14,187.0	15,167.0	16,224.0
Total display	1,478.0	1,825.0	2,421.0	3,259.0	3,765.0	4,178.0	5,249.0	5,755.0	6,295.0	6,855.0
Banners, native + other display	*1,279.0*	*1,515.0*	*1,979.0*	*2,495.0*	*2,677.0*	*2,569.0*	*2,939.2*	*2,877.5*	*2,517.6*	*2,217.0*
Video	*200.0*	*310.0*	*442.0*	*764.0*	*1,088.0*	*1,609.0*	*2,309.8*	*2,877.5*	*3,777.4*	*4,638.0*

Programmatic spend (£ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	237.0	511.0	1,138.0	1,911.0	2,711.0	3,090.0	4,451.0	5,006.0	5,596.0	6,002.0
Banners, native + other display	-	-	-	-	*1,925.0*	*1,658.9*	*2,092.0*	*2,102.5*	*1,958.6*	*1,551.2*
Video	-	-	-	-	*786.0*	*1,431.1*	*2,359.0*	*2,903.5*	*3,637.4*	*4,450.8*

Programmatic spend by type of deal (£ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Open (RTB)	-	-	-	-	-	1,228.8	1,557.8	1,501.8	1,399.0	1,380.5
All direct deals *	-	-	-	-	-	1,843.2	2,893.2	3,504.2	4,197.1	4,621.5

Top five buy side technology in market (2018)

1 DV360
2 TheTradeDesk
3 Amazon Advertising Platform
4 Verizon
5 Adobe

Top five sell side vendors in market (2018)

1 Google Adx
2 Index
3 Pubmatic
4 SpotX
5 Rubicon

Source: IAB, Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	2.58	3.16	4.20	5.60	6.69	12.36	16.44
Display	1.91	2.31	3.42	4.36	5.15	8.35	13.71
Mobile	1.91	2.31	2.16	3.13	2.85	-	-
Video	3.43	1.60	25.79	19.90	19.96	23.74	27.41
Social	-	0.21	0.81	-	-	-	-

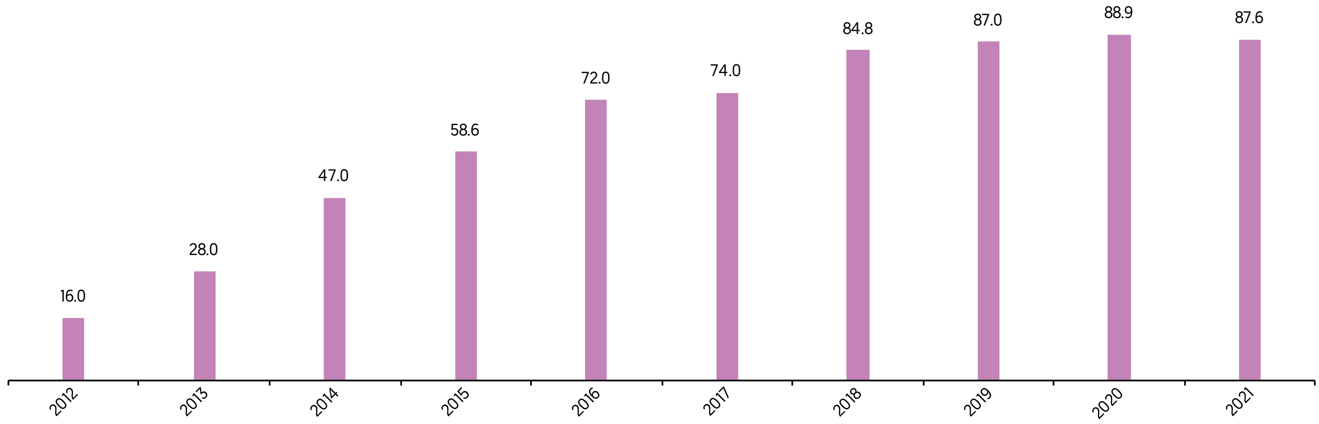
Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	2.73	1.72	2.86	3.11	4.12	4.91	4.64
Display	3.43	1.60	4.66	3.24	3.73	5.81	4.84
Mobile	3.43	1.60	1.28	1.58	2.98	-	-
Video	1.85	2.37	1.49	2.20	4.72	4.25	4.29
Social	-	1.20	2.19	-	-	-	-

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.09	0.18	0.15	0.18	0.16	0.25	0.35
Display	0.06	0.14	0.07	0.13	0.14	0.14	0.28
Mobile	0.06	0.14	0.17	0.20	0.10	-	-
Video	0.06	0.14	1.73	0.90	0.42	0.56	0.64
Social	-	0.02	0.04	-	-	-	-

Programmatic share of display advertising spend (%)



In the ten years since the birth of programmatic trading, the industry has seen exceptional growth, constant change and ever-evolving complexity. In 2018 it accounted for 85% of all display adspend in the UK. More than a trend, programmatic trading is an addressable solution to trade tailored content to targeted individuals though digital inventory across channels.

Although there was a slight dip in May when GDPR came into effect (most noticeably outside the UK), activity levels soon returned and, though there is potential for another setback when legislative interpretation improves, the immediate outlook looks encouraging. We forecast continued strong growth in programmatic adspend to 2021, when it will exceed £6 billion and represent 88% of all UK digital display ad spending.

In 2018 video became the largest type of programmatic inventory, and it will account for 58% of programmatic adspend this year. About 80% of programmatic ads appear on mobile devices. These proportions reflect the high amount of social media inventory that's traded programmatically in the UK.

Continued desire for more control over placement is leading brands to spend more in Programmatic Direct and Private Marketplace deals. Open Exchanges will continue to grow, but not at the same rate as these more controlled direct deals. This is why the use of whitelisting with header bidding is becoming more popular. The declining availability and reliability of third-party cookies is making publishers' first-party data more valuable.

Outside the more traditional programmatic channels, connected TV, programmatic audio and digital out-of-home (DOOH) are emerging as exciting new omnichannel opportunities, thanks to programmatic technology. Omnichannel marketing, like programmatic trading, is not new, but the marriage of the two allows for new levels of innovation, effectiveness and efficiency, enhancing the opportunity through more accountable, accessible, flexible and creative executions. The fact that demand-side platforms like Google's DV360 are heavily promoting these new channels is a sign of their growing importance.

The major DSPs have been developing supply-side technologies to integrate out-of-home and audio this year. We expect audio in particular to attract new programmatic adspend. Nevertheless, we see OTT, Connected TV and advances in addressable TV as the big revenue opportunities for programmatic trading in the future.

United States of America

Forecasts

Advertising spend (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total digital	33,322	39,661	47,338	56,435	66,838	84,125	104,108	120,181	135,126	151,700
Total display	16,840	21,212	26,993	34,143	42,208	54,987	69,608	81,711	93,395	106,204
Banners + other traditional display	*12,797*	*15,996*	*20,228*	*25,619*	*32,150*	*42,093*	*53,076*	*61,342*	*68,993*	*77,078*
Video	*4,043*	*5,216*	*6,765*	*8,524*	*10,058*	*12,894*	*16,532*	*20,368*	*24,402*	*29,126*
Native	-	-	-	-	-	-	-	-	-	-

Programmatic spend (US$ mill)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total programmatic display	2,278	5,534	14,344	21,443	29,770	42,130	55,687	67,342	78,943	91,095
Banners + other traditional display	-	*5,353*	*13,702*	*18,361*	*23,453*	*32,819*	*42,937*	*50,830*	*58,299*	*65,901*
Video	-	*181*	*642*	*3,082*	*6,317*	*9,311*	*12,750*	*16,512*	*20,644*	*25,194*
Native	-	-	-	-	-	-	-	-	-	-

Top five buy side technology in market

1. TradeDesk
2. DV360
3. Facebook Direct
4. Verizon Media
5. Amazon

Top five sell side vendors in market

1. Google
2. OpenX
3. Index Exchange
4. Rubicon
5. AppNexus

Source: Zenith

Cost by media channel

Average programmatic CPM by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	1.24	1.02	1.58	2.75	3.75	21.59	4.89
Display	1.86	1.74	1.97	3.33	4.13	4.98	4.86
Mobile	1.86	1.74	1.60	2.10	4.65	5.73	5.08
Video	2.92	4.67	11.53	15.04	10.76	21.64	12.33
Social*	-	0.59	1.26	2.00	2.23	3.72	2.41

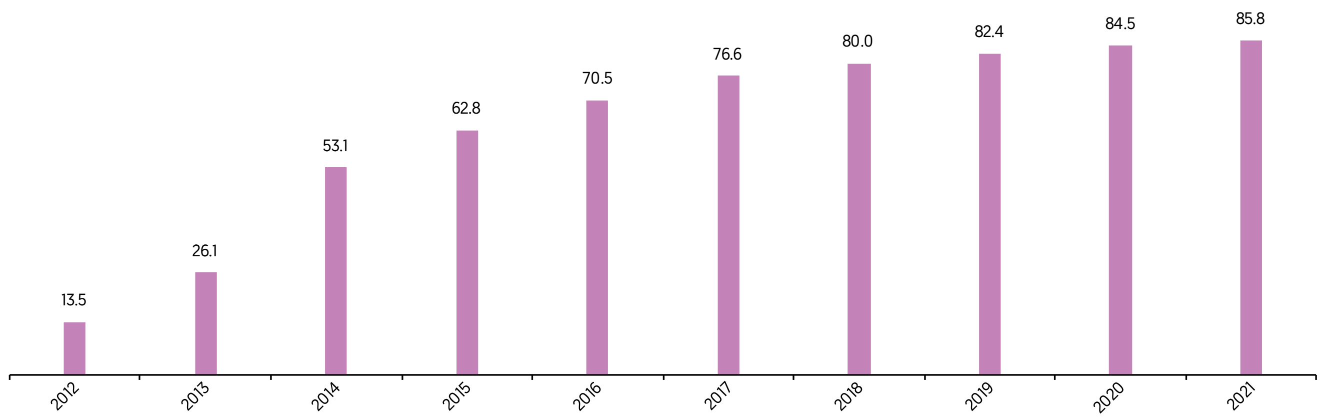
Average programmatic CPC by media channel (US$)

	2012	2013	2014	2015	2016	2017	2018
Overall	1.14	0.67	0.49	0.44	0.93	6.43	1.60
Display	2.92	4.67	2.98	4.55	5.69	5.35	5.19
Mobile	2.92	4.67	0.32	0.58	1.77	3.00	3.19
Video	1.20	1.34	3.20	5.36	4.67	5.63	3.38
Social*	-	0.30	0.27	0.20	0.30	0.49	0.30

Average programmatic CTR by media channel (%)

	2012	2013	2014	2015	2016	2017	2018
Overall	0.11	0.15	0.32	0.62	0.40	0.34	0.30
Display	0.06	0.04	0.07	0.07	0.07	0.09	0.09
Mobile	0.06	0.04	0.51	0.36	0.26	0.19	0.16
Video	0.06	0.04	0.36	0.28	0.23	0.38	0.36
Social*	-	0.20	0.47	1.01	0.73	0.76	0.81

Programmatic share of display advertising spend (%)



The US has adopted advanced programmatic technology across multiple channels. The entire programmatic technology stack is widely used, and mature partners are looking to expand beyond display by providing access to digital out-of-home, connected TV and audio media.

Programmatic spend has increased steadily over time as advertisers, agencies, platforms and publishers have tested new technologies and techniques, learned from and optimised them. Ad tech platforms are working to become more relevant, data-informed, performance-focused, and connected. This in turn encourages vendors to meet the demands of sophisticated marketers with advanced requirements.

More clients have been opting to move towards self-service as their understanding of programmatic has strengthened. They have seen it contribute to higher efficiency, control, transparency and return on investment. Self-service also helps nimble clients get their campaigns to market more quickly. Managed service still plays a role in the US market for some vendor-specific requests where clients favour point solutions over transparency or control.

As programmatic technology develops it is imperative to reiterate and build knowledge at all times at every level of seniority.

Open RTB remains the most common form of programmatic activation. However, we have seen growth within premium inventory environments like Full-Episode Programming. Content investment in creative that goes beyond traditional video is beginning to get a lot of attention from clients. Beyond this, Private Market Place (PMP) and guaranteed deals continue to gather momentum. We expect client concerns over site quality to continue to drive growth in PMP and programmatic guaranteed deals.

Publishers are making more high-quality inventory available for content partnerships and contextual advertising. They have been talking about transparency, compliance and supply-path optimisation during 2019 as they seek more direct links to clients. Vendors are listening to publishers by simplifying SSPs and streamlining providers. Publishers are holding their tech providers to account through supply-path optimisation and demanding access to log-level data. Conversations about supply-path optimisation have also highlighted the importance of first-price auctions and ensured that transparency is at the top of everyone's agenda. The ads.txt project has been widely embraced by the publishing community in North America.

Technology for programmatic trading in newer media channels is still operating in silos, and budgets are still low in comparison to traditional trading. However, more connected TV inventory is being activated programmatically, and publishers are offering more premium inventory, leading to wider adoption among agencies.

The industry is under closer scrutiny than ever, and faces even more with the advent of the California Consumer Privacy Act. It will have to focus more on consumer policy, identity management and the role of the cookie over the coming months and years.

Programmatic marketing is more mature than ever. Clients are demanding a customised experience that is fully tailored to their business.

Programmatic Marketing Forecasts 2019
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