European Parliament

DIRECTORATE-GENERAL FOR INTERNAL POLICIES

POLICY DEPARTMENT A
ECONOMIC AND SCIENTIFIC POLICY

Economic and Monetary Affairs

Employment and Social Affairs

Environment, Public Health and Food Safety

Industry, Research and Energy

Internal Market and Consumer Protection

Over-the-Top players (OTTs)

Study for the IMCO Committee

EN

2015

Over-the-Top players (OTTs)

DIRECTORATE GENERAL FOR INTERNAL POLICIES

POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

Over-the-Top (OTTs) players: Market dynamics and policy challenges

STUDY

Abstract

In this study the authors (1) explore current and emerging business models for over-the-top (OTT) services (including Voice over IP, instant messaging services, and streaming video and music services); (2) identify costs and barriers to European online service development including OTT (3) describe the regulatory environment for online services in Europe, contrasting it with the environment for traditional telecom and media services, as well as the environment in some of Europe's major trading partners; and (4) make recommendations to achieve a Digital Single Market. The study was prepared for Policy Department A at the request of the Internal Market and Consumer Protection Committee.

IP/A/IMCO/FWC/2013-046/

PE 569.979

December 2015

EN

This document was requested by the European Parliament's Committee on the Internal Market and Consumer Protection.

AUTHOR(S)

Ilsa GODLOVITCH, WIK
Bas KOTTERINK, TNO
J. Scott MARCUS, WIK
Pieter NOOREN, TNO
Jop ESMEIJER, TNO
Arnold ROOSENDAAL, TNO

RESPONSIBLE ADMINISTRATORS

Mariusz MACIEJEWSKI
Frederic GOUARDERES
Policy Department Economic and Scientific Policy
European Parliament
B-1047 Brussels
E-mail: Poldep-Economy-Science@ep.europa.eu

EDITORIAL ASSISTANT

Irene VERNACOTOLA
Iveta OZOLINA

LINGUISTIC VERSIONS

Original: EN

ABOUT THE EDITOR

Policy departments provide in-house and external expertise to support EP committees and other parliamentary bodies in shaping legislation and exercising democratic scrutiny over EU internal policies.

To contact Policy Department A or to subscribe to its newsletter please write to:
Poldep-Economy-Science@ep.europa.eu

Manuscript completed in December 2015

This document is available on the Internet at:
www.europarl.europa.eu/supporting-analyses

DISCLAIMER

CONTENTS

LIST OF ABBREVIATIONS AND GLOSSARY 6

LIST OF FIGURES 8

LIST OF TABLES 9

EXECUTIVE SUMMARY 10

1. INTRODUCTION AND CONTEXT 20

1.1. What are *over-the-top* services, and who provides them? 21

1.2. Online services, OTT services, and substitution effects 24

1.3. What is meant by a 'level playing field'? 25

1.4. The Digital revolution: a threat to Europe, or an opportunity? 27

2. CURRENT AND EMERGING BUSINESS MODELS 30

2.1. Usage trends in OTT 31

2.2. The supply side: evolving value chains 34

2.2.1. OTT versus traditional services in voice communications 34

2.2.2. OTT versus traditional messaging and video communication business models 37

2.2.3. Audiovisual media 37

2.2.4. Key observations on the dynamics of the converged value web 41

3. TRENDS IN MEDIA AND COMMUNICATION SERVICES 42

3.1. Medium term outlook on OTT looking forward towards 2020 42

3.2. Long term perspectives looking forward towards 2030 44

3.2.1. Creating content and applications 44

3.2.2. Aggregating content and applications 46

3.2.3. Distributing content and applications 47

3.2.4. Navigating and selecting 48

3.2.5. Consumption of content 49

3.3. New business models 50

3.4. The value of data 52

4. COSTS AND BARRIERS FOR EUROPEAN OTT SERVICES 53

4.1. On Startups and Scale-ups 54

4.1.1. What is a Startup? 54

4.1.2. Startups Expanding into New Markets 57

4.1.3. From startup to scale-up 58

4.2. Barriers for OTTs in the Single Market 59

4.2.1. Barriers and costs in the Single Market 59

4.2.2. Challenges to OTT startups and scale-ups 61

4.2.3. Barriers to free flow of data 61
4.2.4. Barriers to obtaining risk capital 64
4.3. Findings and recommendations 67
5. THE REGULATORY ENVIRONMENT FOR ONLINE AND OTT SERVICES 69
5.1. Common themes affecting regulatory policy 71
5.1.1. What's in a definition? 71
5.1.2. Issues of jurisdiction 73
5.1.3. The role of self-regulation and coregulation 73
5.2. Competition enforcement (including network neutrality) 74
5.2.1. Network neutrality 74
5.2.2. IP interconnection 77
5.2.3. Competition concerns raised by dominant platforms 79
5.2.4. Switching and customer lock-in 81
5.3. Broadband policy 83
5.4. Managing data online 85
5.4.1. Privacy and security 86
5.4.2. Data retention, lawful interception and liability of intermediaries 90
5.5. Consumer protection 92
5.5.1. Requirements on audiovisual media service providers 92
5.5.2. Contractual safeguards for communication services 93
5.6. Taxation and levies 95
5.7. Copyright and geo-blocking 98
6. ADDRESSING BARRIERS TO ONLINE SERVICES: WILL THE COMMISSION'S DSM STRATEGY DELIVER? 102
6.1. The main barriers to European OTT scale-up 102
6.1.1. Access to capital 103
6.1.2. High level barriers 103
6.1.3. Barriers to free flow of data and content 103
6.2. Challenges across the value chain 103
6.3. Competition concerns in the online environment 104
6.4. The Commission's Digital Single Market (DSM) strategy 104
6.4.1. The DSM strategy 104
6.4.2. The views of the European Council 105
6.4.3. Initial input from the European Parliament 106
6.4.4. Our view 106

7. RECOMMENDATIONS ON A REGIME FOR EUROPEAN OTTS, ONLINE SERVICES, AND STARTUPS 110

7.1. Strengthening the European online/OTT startup and scale-up ecosystem 110

7.2. Foster cross-border access to digital content (including European works) 111

7.3. Level the playing field among the Member States (and address OTT/telco anomalies at the same time) 112

7.4. Streamline and simplify privacy, data protection and security 112

7.5. Clarify competition approach to digital platforms and services 113

7.6. The Commission's Digital Single Market initiative 113

7.7. What could be the impact of an effective Digital Single Market? 114

7.8. Issues requiring further research 114

REFERENCES 118

ANNEX 1: KEY DEFINITIONS 124

ANNEX 2: OBLIGATIONS AND STANDARDS 126

LIST OF ABBREVIATIONS AND GLOSSARY

5G (5th generation mobile networks or 5th generation wireless systems) denotes the next major phase of mobile telecommunications standards beyond 4G/IMT-Advanced

AVMS Audiovisual Media services

CALEA Communications Assistance for Law Enforcement Act

CAP Content and Application Provider

CATCH-UP Catch up TV (or Replay TV) is VOD in which television shows are available for a period of days after the original television broadcast

CDN Content Delivery Network

CMU Capital Markets Union

CRD Consumer Rights Directive

DAE Digital Agenda for Europe

DPD Data Protection Directive

DSM Digital Single Market

EBU European Broadcasting Union

ECN Electronic Communications Networks

ECS Electronic Communications Services

EDAA European Interactive Digital Advertising Alliance

EFSI European Fund for Strategic Investment

ENISA European Network and Information Security Agency

EPG Electronic Program Guide

ERG European Regulators Group

FISA	Foreign Intelligence Surveillance Act
FTTH	Fiber To The Home
GDPR	General Data Protection Regulation
IoT	Internet of Things
IPO	Initial Public Offering
IPTV	(Television over IP) IPTV is the distribution of video programming (one way) by means of the Internet Protocol.
ISP	Internet Service Provider
ISS	Information Society Services
LtE	Long-term Evolution
LVCR	Low Value Consignments Relief
NGN	Next Generation Networks
NIS	Network and Information Security
NRA	National Regulatory Agency
OTT	(Over The Top) is a generic term commonly used to refer to the delivery of audio, video, and other media over the Internet without the involvement of a multiple-system operator in the control or distribution of the content
QoS	Quality of Service
RFEC	Regulatory Framework for Electronic Communications
SVoD	Subscription Video-on-Demand
TSM	Telecoms Single Market
USD	Universal Service Directive
VOD	Video on Demand
VOIP	Voice over IP

LIST OF FIGURES

Figure 1. Many new forms of online services 10
Figure 2. Distinguishing between Managed, Online or OTT services 11
Figure 3. Volume of messages from mobile handsets 11
Figure 4. Netflix rise in Europe 12
Figure 5. Cloud Services Market EU vs US 14
Figure 6. The 2010 DAE challenges – a sense of déjà vu ? 16
Figure 7. Different forms of content and application services. 24
Figure 8. Examples of online services companies and services. 25
Figure 9. Volume of messages sent from mobile handsets worldwide, historical development 2010-2013 and projection 2014-2018. 31
Figure 10. SMS volume and number of WhatsApp users at KPN. 32
Figure 11. Proportion of watching activities for UK viewers 33
Figure 12. Growth of Subscription Video-on-Demand (SVoD) revenues and the Netflix share in it. 33
Figure 13. Voice communication offered by Orange (in orange) and Skype (in blue). 35
Figure 14. Voice, video and messaging communication services offered by Orange (in orange), Skype (in blue), Apple (black) and WhatsApp (green). 37
Figure 15. Managed and online delivery of catch-up television content from the Eurovision Song Contest. The managed service (in pink) is provided by Deutsche Telekom, the online service (in green) by ARD. 38
Figure 16. Delivery of catch-up television and VoD services by Deutsche Telekom (in pink), by ARD (green), YouTube (blue) and Netflix (red). 40
Figure 17. Many online service providers increase their control over the distribution and quality by using their own infrastructure. 41
Figure 18. Global Internet Traffic forecast 43
Figure 19. Declining revenues in traditional telcommunication services. 44
Figure 20. The VR Ecosystem 45
Figure 21. Accelerator programmes listed on F6S (2015) 56
Figure 22. Startups in IoT and Big Data 58
Figure 23. Parties to which relevant regulatory and policy measures could apply. 70
Figure 24 : The 2010 DAE challenges – a sense of déjà vu ? 107

LIST OF TABLES

Table 1. SWOT analysis of Europe in capitalising on the migration to online services in general, and OTT services in particular 29
Table 2. Key barriers to the Single Market and potential policy responses 59
Table 3. Cross-border data flow restrictions 62
Table 4. Countries imposing localisation or data storage requirements 63
Table 5. Cinema admissions in the EU. 99
Table 6. Definitions 124
Table 7. Obligations and standards 126

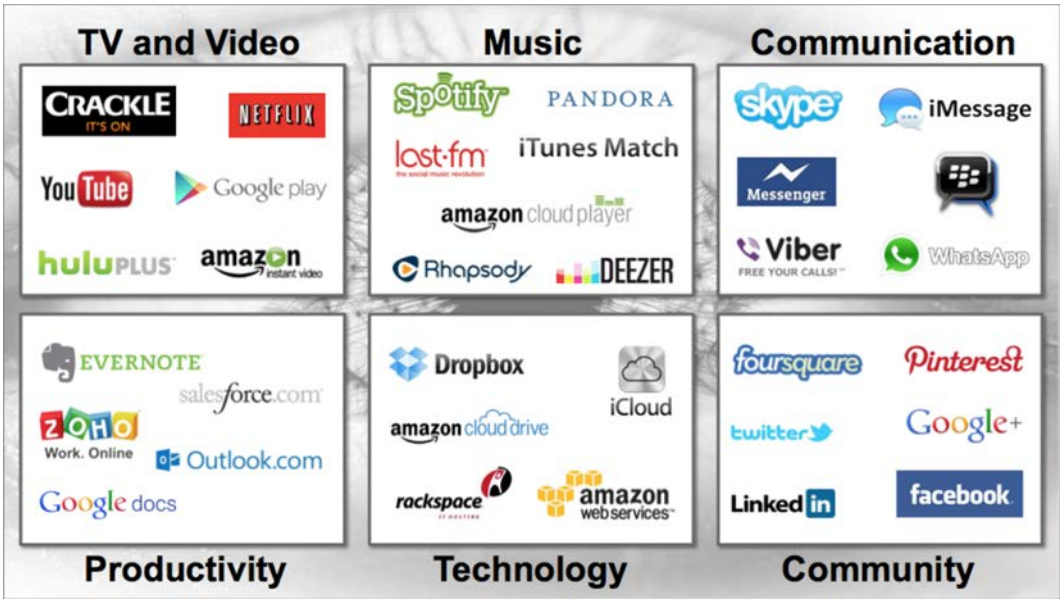
Executive Summary

The digitalisation of content and services has increased choice, innovation and competition and provides a crucial opportunity to realise a genuine Single Market for goods and services in Europe. At the same time, however, it has revealed weaknesses and fragmentation in Europe's regulatory system and has introduced new (often global) competitors who disrupt previous market structures.

In view of these developments, there have been growing calls for action from the European Parliament[1] and Council[2] to complete Europe's Digital Single Market. In May 2015, the European Commission launched a programme of regulatory reform to achieve a Digital Single Market (DSM)[3], and opened a sector inquiry into potential competition issues affecting e-commerce.[4]

In this study,[5] we (1) explore current and emerging business models for *over-the-top (OTT)* services (including Voice over IP, instant messaging services, and streaming video and music services); (2) identify costs and barriers to European online service development including over-the-top (OTT); (3) describe the regulatory environment for online services in Europe, as well as the environment in some of Europe's major trading partners; and (4) make recommendations for digital policy.

Figure 1. Many new forms of online services



Source: ottsource.com/ott-blog

[1] European Parliament Resolutions in 2012 and 2013 initiated by the IMCO committee's e-commerce working group

[2] European Council 2013 Conclusions call for the completion of the Digital Single Market by 2015

[3] European Commission (2015), "A Digital Single Market Strategy for Europe", COM (2015) 192 final.

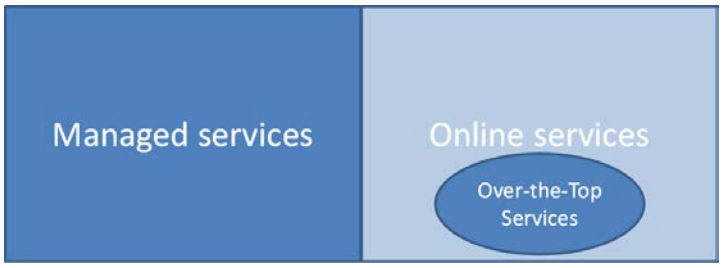
[4] Commission launches e-commerce sector inquiry http://europa.eu/rapid/press-release_MEMO-15-4922_en.htm

[5] This report has been prepared by TNO and WIK-Consult in response to a request from the European Parliament to perform a study on "Over-the-Top (OTT) players" under contract IP/A/ITRE/FWC/2013-046/Lot2 - Digital Agenda and ICT.

The Internet has enabled disruptive entry across many sectors

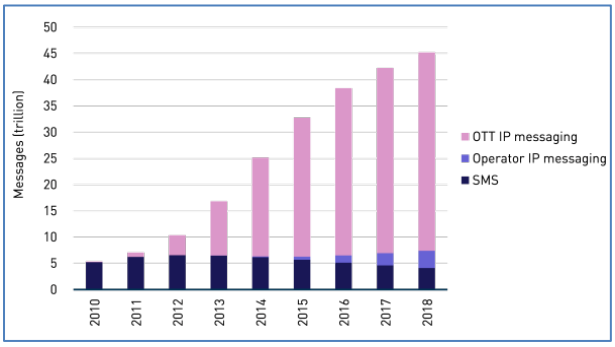
Online content, applications and services are rapidly pervading all segments of commerce and society, and are affecting and disrupting traditional industries in many ways. Consumers can use online video instead of traditional television, online communications platforms instead of traditional telephone services, and can download films and music that were once provided on physical media. The process of advertising and searching for services is increasingly moving online. These changes have come about because broadband connectivity provides instant access to a global network of services and applications, enabling equipment manufacturers, applications providers and customers to bypass the services offered by traditional network operators and to cross national boundaries, thus obtaining multiple new routes to market.

Figure 2. Distinguishing between Managed, Online or OTT services



We use the term over-the-top (OTT) to refer to online services which could substitute to some degree for traditional media and telecom services. Figure 3 shows how the growth of online messaging applications has apparently impacted the volumes of SMS, with consequences for voice and messaging revenues for traditional telecom operators.

Figure 3. Volume of messages from mobile handsets



Source: Analysys Mason[6], 2014

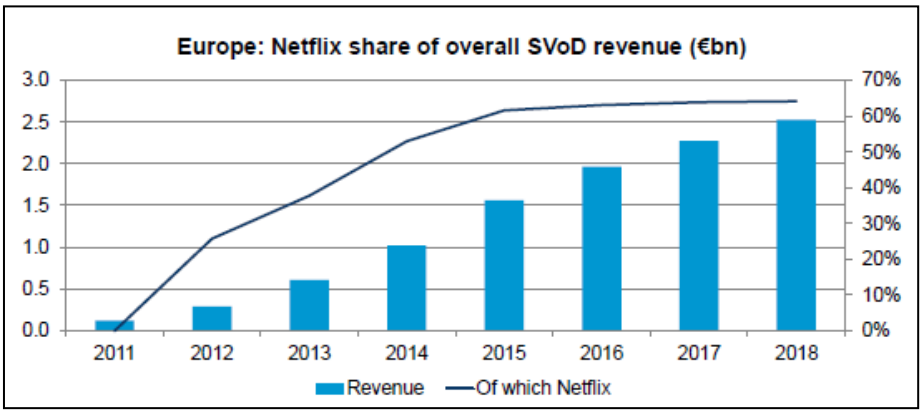
Meanwhile, video is increasingly moving online[7], such that Netflix now accounts for nearly half of the subscription TV-on-demand revenues in Europe (Figure 4).[8]

[6] See http://www.analysysmason.com/About-Us/News/Insight/OTT-messaging-volumes-Jan2014-RDMV0/.

[7] Cisco VNI shows that the majority of Internet traffic derives from video

[8] IHS, The Future of Television, EBU Knowledge Exchange 2014, September 2014, available at http://www3.ebu.ch/calendar/KX14.

Figure 4. Netflix rise in Europe

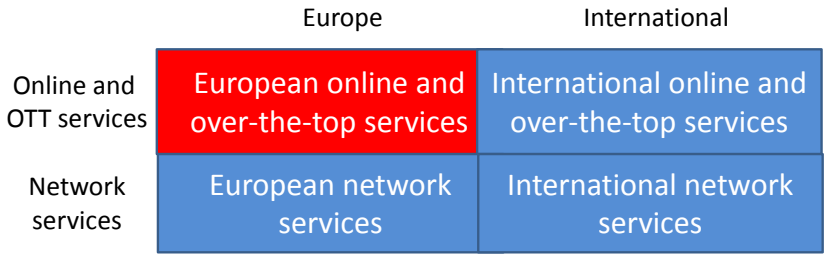


Source: IHS (2014)

What is meant by a level playing field?

The debate about the impact of OTTs is often presented in terms of the *level playing field*. Concerns have been voiced about the challenges faced by traditional network operators faced with the expansion of online (often US-based) firms offering products which consumers increasingly see as alternatives to their offerings. Another aspect of this tension *across* the value chain is the network neutrality debate, which can be viewed as an effort to prevent traditional network operators from blocking or throttling competing or bandwidth-hungry online services, while permitting alternative managed services to evolve.[9]

There are, however, other ways to view the level playing field. Perhaps a more important question is whether there is a level playing field across different countries in Europe and whether European online startups are disadvantaged compared with global competitors due to European fragmentation. The *horizontal* and *vertical* aspects of the level playing field debate (see the following figure) both represent important themes for this study.



Source: WIK-Consult

[9] The network neutrality question has been resolved in Europe, for now at least, thanks to the European Parliament's passage of the Telecoms Single Market legislative package on 27 October 2015.

A threat to Europe, or an opportunity?

Although there are clearly risks and potential losers in the new wave of online competition, it is crucial to bear in mind that this same migration carries not only risks, but also countless opportunities for Europe.

Europe has lost some ground to the United States in recent years, but Europe is not an inherently weak player in this space. In 2014, thirteen(!) European technology companies became 'unicorns' valued at over 1 billion USD.[10] Europe has significant strength in manufacturing – many aspects of the emerging **Internet of Things** and of smart cars would appear to play to European strengths. Europe has a strong technological base, and a highly educated population. In fact, **Europe already produces as many online startups in IoT and Big Data as the US**[11]; however, our challenges lie in the next phase, in helping startups grow to scale, a dynamic which is shown to be a key engine for growth[12]. Meanwhile, Europe's ability to innovate faces well-known challenges, notably including a society that is not altogether friendly to innovation and entrepreneurship, that lacks venture capital, and where there are important restrictions on the free flow of data so vital to the creation and growth of online services.

Europe should seek (1) to capitalise on its strengths, (2) to mitigate its weaknesses, (3) to guard against relevant threats where possible, and (4) insofar as possible, to realise its opportunities. These Strengths, Weaknesses, Opportunities and Threats can best be visualised by means of the following SWOT analysis.

	Helpful	Harmful
Inputs	**Strengths** • Size of the EU economy. • A large and highly educated, adaptable workforce. • A relatively strong and technologically innovative manufacturing sector. • Increasing speed and capability of devices and services, enhanced price performance (Moore's Law). • Economic and cultural diversity of the EU.	**Weaknesses** • Lack of an entrepreneurial culture, together with a high social and economic price on failure. • Potentially linked challenges in accessing venture capital • Inertia, resistance to process change. • Fragmentation of Europe into Member States with different linguistic, administrative, legal, regulatory, and cultural processes and traditions. • Lack of leadership at EU level. • Complex and inconsistent taxation. • Gaps in fixed and mobile deployment and adoption of ultra-fast broadband.
Outputs	**Opportunities** • Gains in GDP and *overall* gains in (skilled) employment. • Economies of scale and scope. • Lower unit costs. • Lower transaction costs. • Overall acceleration of business. • Enhanced innovation.	**Threats** • Risks of losing further ground to global competitors. • Negative impact on revenues, profit, and employment for impacted sectors and firms. • Privacy and security risks and breaches. • Risks of lock-in. • Risk of access and service monopolisation.

Source: WIK-Consult

[10] Source Tech.eu and GP Bullhound, Europe (2015). The full list: Adyen, BlaBlaCar, Delivery Hero, FanDuel, Farfetch, Funding Circle, Home24, Powa, Rocket Internet, Shazam, Skrill, TransferWise, Ve.

[11] There are 2,500 IoT and nearly 8,000 Data and Analytics US/EU startups. Around half are based in Europe (Source F6S.com data)

[12] According to an Octopus UK study (2015) 1% of scale-ups generate 38% of growth and 68% of jobs

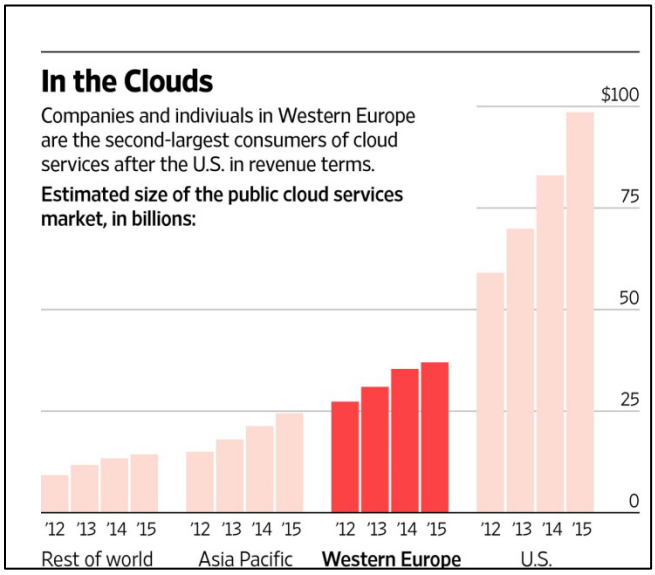
What are the main bottlenecks for online scale-ups in Europe

The main challenges to European OTTs concern regulatory and linguistic fragmentation – resulting for example in important restrictions on the free flow of data, and limited access to venture capital compared to the US.[13]

The **lack of risk capital** for high technology innovation is a particular issue for startups, and an even more pronounced issue for *scale-ups* - firms that are seeking to reach the next phase of growth. Emerging and existing instruments have sought to address this, but none of them are on point. The Commission's recently published Action Plan on Building a Capital Markets Union could potentially represent a vehicle through which these deficits could begin to be addressed.

An important and complex regulatory restriction is **barriers to the free flow of data and content**. For example, fragmented data protection regulation (together with associated issues such as data localisation requirements) hinders the expansion of cloud computing. Copyright restrictions hinder the development of European content aggregators. Data is the fuel of fast growing online scale-ups. Impediments to a seamless flow of data across and beyond Europe put European companies at a serious disadvantage.

Figure 5. Cloud Services Market EU vs US



Source: Gartner (2015)

Finally, the **cost of compliance with regulatory obligations** tends to be higher in Europe than in more uniform jurisdictions such as the US, presenting an important barrier to the expansion of SMEs. Consumer protection rules and VAT are two areas where compliance with rules in the *country of destination* raises costs for (smaller) suppliers.

In contrast, online providers expanding in the US have benefited from a 'temporary' exemption on sales tax and generally light touch data protection rules[14], although stringent requirements exist for certain sectors in the US.

[13] In many other contexts, Europe's cultural and linguistic diversity is a strength.

Should OTT and telecom services be treated in the same way?

Although it is clearly a *challenge* for telecom operators in Europe, we do not subscribe to the view that the erosion of traditional telecom service revenues due to OTT development is a core problem for policy makers. Any imbalance in the interconnection payment arrangements between telcos and OTTs could be addressed through existing rules if it became a genuine problem, while anti-competitive discrimination from telecom operators affecting OTTs could in principle be addressed via the newly adopted Telecom Single Market provisions on net neutrality.

The telco OTT level playing field debate does, however, raise important **questions around the scope of sectoral legislation**, such as the EU Framework for electronic communications. Specifically, traditional telecom firms which are covered by sectoral legislation may in some cases be subject to more stringent rules (for example concerning consumer protection, privacy and sectoral levies) than OTT providers offering services which are ostensibly similar. Everyone would agree that similar services should, all things being equal, be treated in a similar manner. Important questions, however, remain over the extent to which OTT services are full substitutes for Electronic Communication Services (ECS), whether the rationale behind the sectoral legislation currently applied to ECS is relevant for OTTs (or indeed is still relevant for ECS in all cases), and whether it would be practicable or proportionate to extend existing sectoral rules to OTT players. In general, we favour definitions that are based on the perceptions of consumers rather than on delivery or payment methods, and a regulatory approach that favours a 'levelling-down' of regulation, with reliance on horizontal legislation and standards for digital services wherever possible. The costs and benefits of any such approach would, however, need to be carefully considered.

Competition concerns in the digital environment

Online service markets are typically dynamic and fast-moving. In these circumstances, dominant positions may not be enduring. Some smaller online service providers have nonetheless raised concerns over the strong market position of significant online platforms, on which they may rely for distribution and marketing. Another key competition concern in the digital era affecting start-ups and scale-ups as well as consumers relates to the **portability of data** – for example between cloud services or in relation to media.

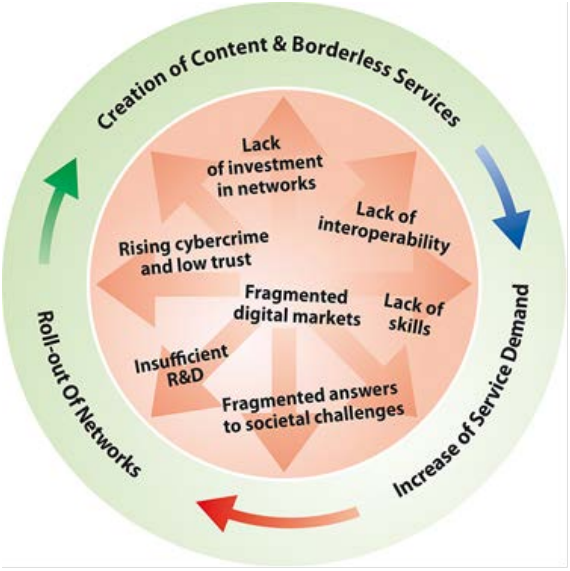
The Commission's Digital Market Strategy

In a Communication issued in May 2015, the Commission set out its broad strategy to achieve a Digital Single Market including proposed actions on many of these points.

The Commission's DSM Strategy generally covers the right issues; however, an overarching comment is that many of these issues are not new, but were raised in the context of the Commission's Digital Agenda for Europe of 2010, as seen in the figure below. Moreover the key milestones listed in the DSM Strategy concern legislative initiatives and investigations to be conducted within the coming two years, as opposed to measurable targets for outcomes. Is it too focused on the *means* as distinct from the *ends*? Given the lengthy time frames involved in legislation, one could also ask – when will it deliver?

[14] In the US, unlike in Europe, data protection is not viewed as the right of the end-user

Figure 6. The 2010 DAE challenges – a sense of déjà vu ?



As regards the specific measures, there are a number of areas where we believe more ambition is warranted to achieve a truly single market. These include data protection and security, consumer protection and copyright, where a vision of rules which are directly harmonised at EU level could provide at least a starting point for any fresh proposals.

At the same time, there are other proposals which require more caution and a thorough cost benefit analysis due to the potential costs and legal risks these could apply on online service providers (including European firms), as well as the challenges these could present for enforcement. We have particular concerns about suggestions to extend the scope of sectoral measures on audiovisual media services and privacy as well as placing a 'duty of care' on intermediaries. In a world which is increasingly becoming digitalised and subject to cross-border provision, horizontal measures at EU level should be preferred to sectoral rules in general, and the role of global standards and codes of conduct should also be carefully considered.

Finally, there are some issues which provide important underpinnings for a DSM but that are so far missing at least from this strategy. Mobile connectivity is notably absent as a concrete EU goal, even though it is likely to be essential for the ubiquitous accessibility of online services and the IoT. Business connectivity also receives less attention than it should in view of the role that online services could play in boosting productivity.[15] The linkages between venture capital availability (addressed through the Capital Union initiative) and online scale-ups should also be acknowledged.

[15] See for example WIK (2013) Business communications, economic growth and the Competitive Challenge

Considering the impact of policy measures

Many of the observations we make concerning the Commission's DSM Strategy stem from applying the principles of Better Regulation. It is also important in this context to prioritise actions by quantifying the potential benefits alongside the costs. An upcoming London Economics study 'Medium Term Assessment on Reducing Costs and Barriers for Businesses in the Single Market' suggests that addressing consumer protection, trust and privacy issues alongside creating the right standards to support cloud computing could benefit Europe by more than €200 billion per year. In contrast, the (still important) impact of abolishing roaming surcharges is estimated in the study at €5 billion per year.

Key recommendations on a regime for European OTTs, online services, and startups

The *challenges* in the following table of key recommendations correspond to weaknesses or threats identified in the SWOT analysis, while our *recommendations* to the Parliament seek to mitigate them. The *legislative implications* assess the degree to which these needs appear to be addressed (or not addressed) by the DSM strategy that the Commission put forward in May 2015, together with other legislative measures that are either proposed or in progress.

Many of the issues we have addressed require further study. One especially timely initiative that requires further analysis on the part of the EP is the ongoing review of the EU regulatory framework for electronic communications. Another would be to investigate the role of online platforms in the digitalised economy. Further issues of interest could be an evaluation of the DAE to provide lessons for future initiatives and an analysis of what could be appropriate measurable targets for a Digital Single Market.

Challenge	Recommendations to support online start-ups	Legislative implications
1. Strengthen the European online/OTT startup and scale-up ecosystem		
Limited access to venture capital	• Analyse why measures taken to date have been ineffective. • Speed up existing measures to make venture capital available to high potential (online) startups. • Encourage European Corporates to invest in startups	Might be addressed in the upcoming Capital Market Union (CMU).
Lack of an entrepreneurial culture	• Encourage calculated risk-taking by making bankruptcy laws more forgiving and more consistent across the Member States.	Partly addressed in the upcoming CMU.
Lack of ubiquitous platforms for delivery	• Introduce specific targets for mobile and business connectivity.	Inclusion in successor targets to DAE.
Tax regime creates complexity in EU and inconsistency outside	• Simplify the EU VAT regime. Establish a VAT threshold in order to promote the creation and initial growth of European start-ups, OTTs, and online services. • Address the low value consignments relief (LVCR) exemption for third countries.	Included in the DSM.
Unintended consequences from regulatory reform	• Stress-test the impact of digital regulation before its introduction, possibly through Policy Labs (new initiatives in the UK and the Netherlands).	Potential inclusion in 'Better Regulation' toolkit.

2. Foster cross-border access to digital content (including European works)		
Policy for cross border distribution is disjointed	• The linkages between audiovisual media policy, copyright, and geo-blocking need to be more clearly thought through, more concrete, and more fully elaborated.	More ambition is needed.
Limited distribution of European works	• Consider alternative solutions to promoting European works as opposed to expanding the scope of the AVMS Directive to online services. as this could be burdensome and hard to enforce	Seek alternative solutions to expanding AVMSD scope.
3. Level the EU level playing field (which will also address any telco/OTT inconsistencies)		
Overlapping sectoral and horizontal rules	• Define services in terms of the way they are viewed by consumers rather than according to the technological or payment mechanisms involved. The 'managed' vs OTT distinction is unhelpful – likewise 'traditional' vs 'digital' • Consider reducing the scope of the EU Framework for electronic communications to connectivity. Review implications thoroughly.	Can be addressed by the review of the regulatory framework for electronic communications (RFEC).
Rules can be inconsistent within EU, or burdensome in comparison with other jurisdictions	• Research potential for full EU harmonisation and enforcement systems (including EU bodies) for rules (for instance, consumer protection) applying to online service providers. Where full harmonisation is not feasible, favour rules based on the *country of origin* principle. • Consider self or co-regulatory measures or enforcing legislation before new legislation.	More ambition is needed on harmonisation, more focus on streamlining legislation.
4.Streamline and simplify privacy, data protection, and security		
Data protection rules are complex, and implementation inconsistent, undermining data flows	• EU privacy and security rules should be streamlined and simplified. • Consider repealing some or all provisions within the sector specific e-Privacy Directive if cross sectoral measures e.g. GDPR can be made to substantially address the relevant issues. • Any change to the "mere conduit" provisions which limit liability for intermediaries should carefully weigh the impact on smaller intermediaries, as well as the practicability of enforcement.	More ambition is needed, with a focus on streamlining.
The rejection of safe harbour has created a legal vacuum	• Put new arrangements in place to replace the Safe Harbour arrangements that have just been invalidated by the ECJ.	A solution is urgently needed, but challenging.
NIS security arrangements are immature	• NIS Directive provisions should address security concerns in a manner that is not unduly onerous or impractical for online and OTT services, including startups and scale-ups.	Can be addressed within the NIS.
5.Clarify competition approach to digital platforms and		

services		
Emerging concerns over possible dominance of online platforms are being handled in different ways	• Further research into competition policy (and the regulatory environment) for platforms and the sharing economy is warranted. • Analyse the use, effectiveness and efficiency of national provisions to combat unfair business practices. • Competition policy needs to consider more fully (1) the speed with which new disruptive market entry is possible; (2) dynamic effects, including the benefits to consumers of new services; and (3) the complex dynamics of two-sided markets.	Research is called for.
Risk of lock-in, risk of service monopolisation	• GDPR provisions concerning data portability are likely to be important for the future competitiveness of digital services. Commercial standardisation and widespread adoption of standardised data formats as well as switching processes would likely be needed to ensure that solutions are workable for suppliers and customers. A comparison of benefits to costs on implementing solutions is warranted.	Can be addressed within the GDPR. More concrete focus on implementation is needed.

1. INTRODUCTION AND CONTEXT

KEY FINDINGS

- There is no single, generally agreed definition of terms for many of the key concepts in this discussion, including *over-the-top (OTT) services*. For purposes of this study, an *over-the-top (OTT) service* is an online service that can be regarded as potentially substituting for traditional telecommunications and audiovisual services such as voice telephony, SMS and television.
- OTT services represent a subset of *online services*, which differ from *managed services*. For purposes of this study, *managed services* are those where the provider offering the service has substantial control over the fixed or mobile access network used for its distribution. The provider may be able to use this control to size its network, or to reserve network capacity to guarantee the quality of the service. *Online services*, by contrast, depend on the public Internet for their delivery, at least in part; consequently, no single network operator can guarantee the quality of the service delivered.
- Substitutability is useful as a distinguishing hallmark of an OTT service inasmuch as it is measurable and testable. To the extent that the services are *substitutes*, the more that a consumer purchases of one, the less they are likely to purchase of the other; conversely, if they are *complements*, an increase in consumption of one implies an increase in the consumption of the other as well.
- Substitution effects also apply to many online services that are not OTT in the session that they do not compete with traditional communication services. They may compete with "brick and mortar" stores, with banks, or (in the case of Uber) with taxi services. The policy questions raised are complex – these new services may be disruptive to existing market players, but they benefit consumers.
- As a general rule, one might expect that similar services that are similarly situated, and that compete with one another, should be subject to obligations that are similar (to the extent that doing so is practical).
- Applying the notion of "imposing similar obligations on OTT services to those imposed on equivalent traditional services" is exceedingly challenging in practice. To what degree are the services in fact equivalent? Does the OTT service in fact raise the same issues as those to which regulation of the corresponding traditional service seeks to respond? Given the implementation differences between traditional versus online services, to what degree is it proportionate or realistic to impose equivalent obligations?
- Voice over IP (VoIP) can be viewed as having been the first major OTT service. Regulatory experience with VoIP provides useful signposts for the study of the OTT area as a whole.
- The migration to online services in Europe carries not only risks, but also countless opportunities for Europe.
- Europe is not an inherently weak player in this space. Europe has significant strengths in manufacturing, for instance – many aspects of the Internet of Things and of smart cars would appear to play to European strengths. Europe also has a good technological base, and a highly educated population.

In this study,[16] we explore current and emerging business models for OTT services (including Voice over IP, instant messaging services, and streaming video and music services), identify costs and barriers to European OTT development and describe the regulatory environment for OTTs in Europe, as well as the environment in some of Europe's major trading partners. The study is particularly timely as it comes at a time when the Parliament is examining a number of relevant issues in connection with the Commission's Digital Single Market (DSM) strategy.[17] A key aim of the study is to provide useful input into that debate.

The study is structured in the following way:

- In Sections 0 and thereafter, we discuss the meaning of OTT services and contrast them with what might be perceived as traditional telecommunications, audiovisual, and broadcasting services as well as with other non-OTT online services. We then close with a brief overview of Europe's strengths and weaknesses relative to OTT and online services, together with the opportunities and threats that OTT and online services represent going forward. This provides important context for the remainder of the study.
- Chapter 2 discusses usage trends for online services in comparison with traditional services, and outlines the business models and interrelationships between different actors that underlie provision of digital services today.
- In Chapter 3, we discuss the future outlook for OTT towards 2030, with a focus on how technological and commercial developments including 5G and the Internet of Things (IoT) may shape the market and business models going forwards.
- In Chapter 4, we discuss the European environment for startup and scale-up OTTs and other online services, contrast it with that of the US, and identify the main costs and barriers for the expansion of OTT services.
- In Chapter 5, we describe the regulatory landscape for OTT and online services in the EU, and contrast this with the regulatory regimes applied to traditional services and with regimes in some of Europe's main trading partners. The discussion is placed in the context of the Commission's Digital Single Market Strategy published in May 2015.
- Chapter 6 explores the degree to which the Commission's DSM Strategy (together with other legislative instruments that are currently proposed or under way) provides a favourable environment for OTT and online services development.
- Finally, Chapter 7 provides recommendations for actions to improve the environment for European OTTs and online startups and scale-ups.

Annex 1 contains provides a number of key definitions, while Annex 2 provides a table that details relevant regulatory and legal obligations.

What are over-the-top services, and who provides them?

It is remarkable that a term that has been so central to the public debate as over-the-top services does not have a single clear, agreed-on definition.[18, 19] Indeed, a number of

[16] This report has been prepared by TNO and WIK-Consult in response to a request from the European Parliament to perform a study on "Over-the-Top (OTT) players" under contract IP/A/ITRE/FWC/2013-046/Lot2 - Digital Agenda and ICT.

[17] European Commission (2015), "A Digital Single Market Strategy for Europe", COM (2015) 192 final.

[18] Perhaps it is not so surprising after all. In our recent study of network neutrality for the European Parliament, we note at the outset that there are many different definitions, and that the differing definitions have different implications for public policy. See J. Scott Marcus, (2014), "Network Neutrality Revisited: Challenges and Responses in the EU and in the US", study prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, Policy

the stakeholders whom we interviewed argued that the term was meaningless or even misleading. We would have to say that we share their concerns.

Finding 1. There is no single, generally agreed definition of terms for many of the key concepts in this discussion, including *over-the-top (OTT) services*.

Wikipedia explains that "… over-the-top content (OTT) refers to delivery of audio, video, and other media over the Internet without the involvement of a [network] operator in the control or distribution of the content. The Internet provider may be aware of the contents of the Internet Protocol packets but is not responsible for, nor able to control, the viewing abilities, copyrights, and/or other redistribution of the content. This model contrasts with the purchasing or rental of video or audio content from an Internet service provider (ISP), such as pay television video on demand or an IPTV video service …" This definition, is sufficient for purposes of this study. Notably, it makes clear that an OTT service is not a transmission network, but is instead a service that runs over an Internet network; moreover, the OTT service provider is typically distinct from the operator of the underlying network.

It is thus clear that over-the-top services, as commonly understood, represent applications or content or both, and that the firms that provide them are *content and applications providers (CAPs)*.[20] We can differentiate between *managed services* and unmanaged *online services* when discussing the offerings of various CAPs. The distinction between *managed services* and *online services and* applications is made based on the characteristics of their underlying distribution mechanism.[21]

- With *managed services*, the provider offering the service has control over the fixed or mobile access network used for its distribution. The provider is able to use this control to dimension the network, and in many cases to reserve network capacity to guarantee the quality of the service. Thus, managed services are strongly linked to the underlying network. Examples of such managed services are fixed and mobile telephony and the IPTV service offered by many network operators.
- *Online services* and the associated applications rely on the public Internet for at least parts of their distribution. The provider has little or no control over a part of the distribution network in particular the access networks. Well-known examples of online services are Skype and YouTube.

Department A, at: http://www.europarl.europa.eu/RegData/etudes/STUD/2014/518751/IPOL_STU%282014%29518751_EN.pdf.

19 See also BEREC (2015), Report on OTT services, BoR (15) 142, October 2015. "OTT is a term frequently used but often not clearly defined."

20 The Board of Regulators of Electronic Communications (BEREC) has often found it useful to refer to Content and Application Providers (CAPs).

21 This distinction between managed and online services is consistent with our approach in an earlier study for the Parliament. See Marcus, J.S., Nooren, P., Cave, J. and Carter, K.R. (2011), "Network Neutrality: Challenges and Responses in the EU and in the US", study prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, Policy Department A, at http://www.europarl.europa.eu/RegData/etudes/etudes/join/2011/457369/IPOL-IMCO_ET(2011)457369_EN.pdf.

Finding 2. For purposes of this study, we define *managed services* to be those where the provider offering the service has substantial control over the fixed or mobile access network used for its distribution. The provider may be able to use this control to size its network, or to reserve network capacity to guarantee the quality of the service. *Online services*, by contrast, depend on the public Internet for their delivery, at least in part; consequently, no single network operator can guarantee the quality of the service delivered.

How meaningful is it to speak of *over-the-top (OTT)* services? In the interviews that we conducted for this study, as previously noted, a number of the market players questioned whether it was meaningful to draw a distinction between different types of content and application service providers. To the extent that it is meaningful at all to speak of over-the-top services, however, it is clear that they are *unmanaged* in the sense meant here[22], and thus represent a form of online services.

The discussion of over-the-top services is largely motivated by the sense that they compete with traditional telecommunications and broadcasting services. Indeed, the policy discussion is largely driven by a perception that they may compete unfairly. To focus the discussion for the purpose of this report, we will consider as an OTT player *any Content and Applications Provider (CAP) providing online services that can be regarded as potentially substituting for traditional telecommunications and audiovisual services such as voice telephony, SMS and television*.[23]

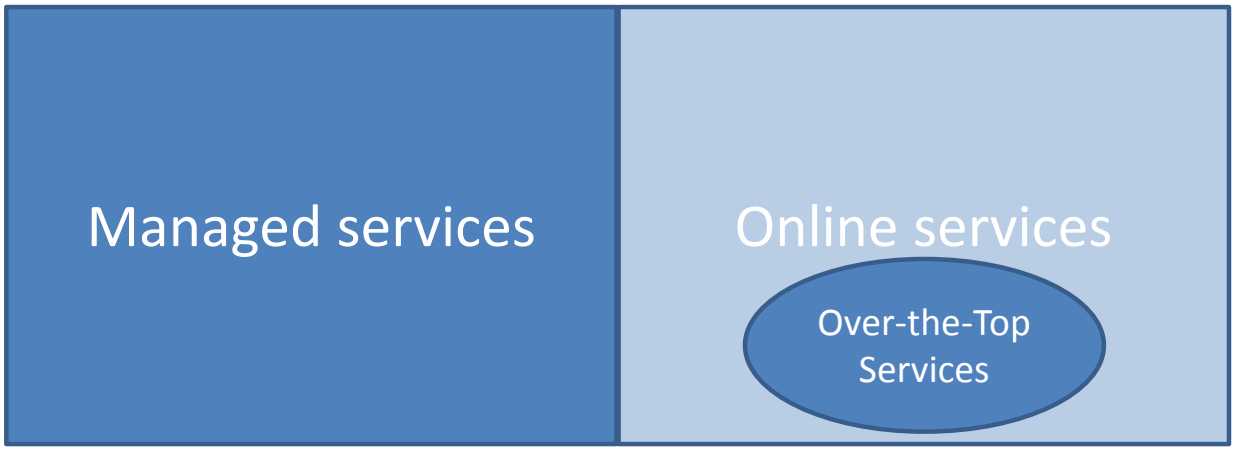
Finding 3. For purposes of this study, an *over-the-top (OTT) service* is an online service that can be regarded as potentially *substituting* for traditional telecommunications and audiovisual services such as voice telephony, SMS and television.

It is sometimes convenient to use *Venn diagrams* to express relationships in terms of *set theory*. We see in Figure 7 that content and application services are comprised of managed services and of other unmanaged online services. All over-the-top services are unmanaged online services, but not all online services (as defined in this study) are over-the-top services, as they do not all compete with traditional telecommunications and broadcast services.

[22] It is increasingly common for online service providers in general and OTT service providers in particular to take measures to enhance the performance of their service (for example through the use of *Content Delivery Networks (CDNs)*; however, as the online service provider does not control the full network path to the end-user, they are not managed services as defined in this section.

[23] Other definitions appear in recent public documents. In the Commission's consultation "Regulatory environment for platforms, online intermediaries, data and cloud computing and the collaborative economy", they define an online platform as "an undertaking operating in two (or multi)-sided markets, which uses the Internet to enable interactions between two or more distinct but interdependent groups of users so as to generate value for at least one of the groups… Internet access providers fall outside the scope of this definition." BEREC's October 2015 document "Report on OTT services", BoR (15) 142, provides a "taxonomy of OTT services that consists of (a) OTT-0 services, which are OTT services that qualify as ECS, (b) OTT-1 services, which are OTT services that do not qualify as ECS but do potentially compete with ECSs and (c) OTT-2 services, which are the remaining category consisting of OTT services that are not an ECS and do not potentially compete with ECSs." Their OTT-1 and OTT-2 services collectively correspond to *OTT services* as used in this report, while the three sub-categories together correspond to *online services* as used in this report.

Figure 7. Different forms of content and application services.



Source: WIK-Consult

We raise at this point several questions, to which we will return throughout the report. For a given over-the-top service:

- Does the service function primarily as an economic *substitute* to a traditional electronic communications or broadcasting service, or as an economic *complement*?[24]
- If a substitute, to what extent is the over-the-top service an *imperfect substitute* for the traditional service?
-

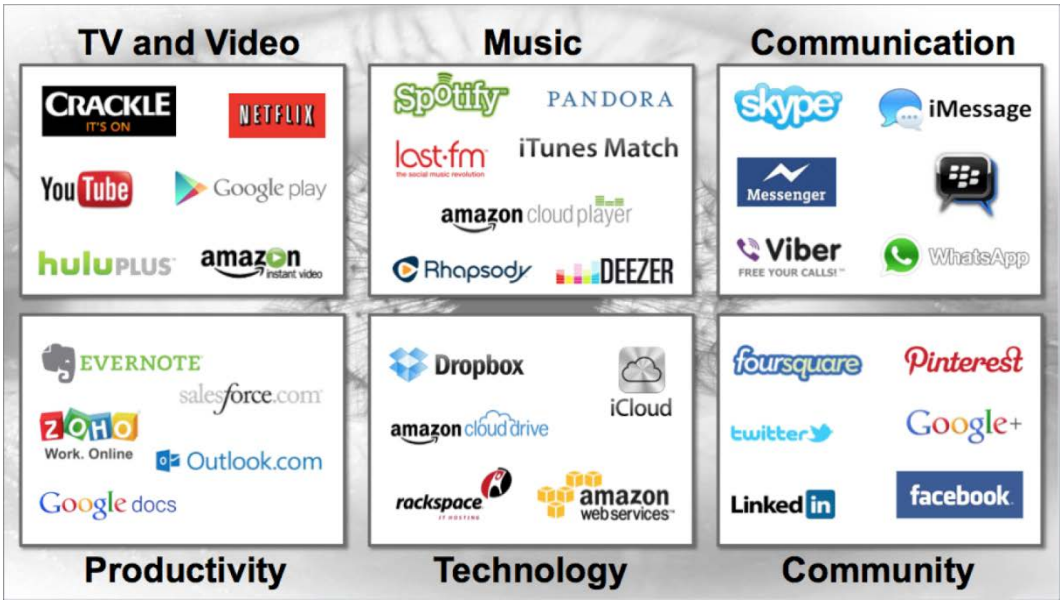
Finding 4. Substitutability is useful as a distinguishing hallmark of an OTT service inasmuch as it is *measurable* and *testable*. To the extent that the services are *substitutes*, the more that a consumer purchases of one, the less they are likely to purchase of the other; conversely, if they are *complements*, an increase in consumption of one implies an increase in the consumption of the other as well.

1.1. Online services, OTT services, and substitution effects

There are numerous content and application services, and numerous providers of content and application services. They can be distinguished based on the function that they serve. A few well-known examples appear in the simplified taxonomy of online services shown in Figure 8. To this taxonomy, one might well include e-commerce sites, financial services, gaming services, and many more.

[24] To the extent that the services are *substitutes*, the more that a consumer purchases of one, the less they are likely to purchase of the other; conversely, if they are *complements*, an increase in consumption of one implies an increase in the consumption of the other as well. Formally, X and Y are substitutes if, when the price of X rises, the demand for Y rises, while the opposite relation holds for complements. There are different degrees of substitutability. For example, a car and a bicycle may substitute to some extent: if the price of motor fuel increases considerably, one may expect that some people will switch to bicycles. At the same time, a car has many capabilities that a bicycle does not (and vice versa), implying that they are not fully interchangeable; consequently, they are *imperfect substitutes* for one another.

Figure 8. Examples of online services companies and services.



Source: http://ottsource.com/ott-blog/

Many of the services depicted in Figure 8 do not concern services that are direct substitutes for traditional services. Some, however, clearly appear to function as substitutes. Among the *communication* services, the growing popularity of online telephony and messaging services Skype and WhatsApp appears to be impacting the usage and thus the revenues of traditional voice telephony and SMS providers.

Traditional television and related audiovisual service providers appear to face similar competition from online service providers (who are thus OTT players as defined in this report). Notably, Netflix represents a prominent new OTT player in the television market.

We have been asked to analyse OTT services in this study. Similar considerations, however, apply to a wide range of online services that are not OTT services (in the sense that they substitute for traditional services that are not communication services). For example, the Uber service substitutes for traditional taxi services. E-commerce applications substitute for "brick and mortar" stores. A range of online services substitute for financial services.

In this report, we provide examples of these services and the concerns that they raise, even though they are arguably not strictly in the scope of the study. This is necessary in order to provide proper context for the OTT discussion. We consider these online services to represent a fruitful area for future studies on the part of the Parliament.

1.2. What is meant by a 'level playing field'?

In recent years, there have been a chorus of complaints, including from telecom network operators, that they face unfair competition from over-the-top providers who are not subject to the same regulatory burdens as network operators. Similar questions and issues are raised in the context of new 'online' competitors challenging other traditional services.

At its heart, this debate, and the concerns which underlie claims about the 'lack of a level playing field' could be characterised as concerns about competition, which may

have been heightened by the clear impact that OTTs (and online services) have had on traditional business models. We consider these claims further in section 5.2.

At another, more technical level, the level playing field could also be considered as a debate about whether similar services are subject to the same rules. In this context, there are few who would disagree with the proposition that similar services that are similarly situated, and that compete with one another, should be subject to obligations that are similar (to the extent that doing so is practical).

The devil, however, is in the detail! A range of practical considerations must then be taken into account:

- To what extent is a given over-the-top service "similar" to a traditional service? In what ways are the two services similar, in what ways different?
- Regulation of traditional telecommunication services has been put into place to address specific perceived problems. Among these, for instance, are last mile market power, and the call termination monopoly (which depends on control of the telephone number). To what extent are these same problems relevant to over-the-top services?
- Supposing that one were to find that a particular over-the-top service should in principle be regulated similarly in some particular respect to a traditional service, to what extent is it practical and feasible to do so? On the one hand, the technology may not lend itself to identical regulatory obligations; on the other hand, the European Union might or might not have sufficient jurisdiction over over-the-top providers based outside of the European Union to impose the obligation, and to make it stick.
- Consistent with the principle of *technological neutrality*, which is a fundamental building block of the European regulatory framework for electronic communications, what steps are feasible to maintain a fair and level playing field between traditional and over-the-top services? Is it meaningful to speak of such a goal? Is this goal *appropriate*? To what extent is it *realistically achievable*?

In this context, it is worth recalling that this is not the first time that technological developments leading to the decoupling of the service from the network have arisen and raised questions over the application of legislative frameworks. For instance, these same issues have been with us from the time that it was first recognised that *packet-switched protocols* in general, and the *Internet Protocol (IP)* in particular, de-coupled *electronic communication services (ECS)* from the underlying *electronic communications network (ECN)*. The regulatory framework for electronic communications that was enacted in 2002 already attempted to address these challenges (1) by distinguishing between the ECS and the ECN, and (2) by embracing an over-arching principle of *technological neutrality*. These measures have helped, in our view, but they have not fully resolved the underlying challenges.

Finding 5. The level playing field concept can be interpreted in various ways. At a basic level, it may represent an expression of concerns over new competitive challenges impacting traditional business models. At a more technical level it can refer to the challenge of applying similar rules to ostensibly similar services. This latter challenge is not however new. The decoupling of IP-based services raised challenges for definitions in the context of the 2002 Electronic Communications Framework.

Finding 6. Applying the notion of "imposing similar obligations on OTT services to those imposed on equivalent traditional services" is exceedingly challenging in practice. To what degree are the services in fact equivalent? Does the OTT service in fact raise the same issues as those to which regulation of the corresponding traditional service seeks to respond? Given the implementation differences between traditional versus online services, to what degree is it proportionate or realistic to impose equivalent obligations?

More widely, in this study, we consider whether the past focus of the 'level playing field' as a question of fair treatment between actors at different levels of the digital value chain may have been too narrow. An alternative view is that the most important aspects of the 'level playing field' may not lie in these tensions, but rather in providing a level playing field for online services across different EU countries, and a level playing field between different regions, enabling digital entrepreneurs to flourish regardless of their location. It is these 'geographic' aspects of the level playing field that form the heart of the discussion in sections 4 and 5.

Finding 7. The level playing field also has a geographic dimension. A particular focus of this study concerns the development of a level playing field for digital services across the EU and between the EU and other regions.

1.3. The Digital revolution: a threat to Europe, or an opportunity?

Existing industries will unquestionably be hurt by certain digitally provided services; that does not necessarily mean, however, that the proper response of public policy can be solely to protect incumbent interests. The movement from horse-drawn carriages to automobiles also disrupted many existing industries, for instance, but that evolution clearly brought large net benefits to society as a whole. The growth on online services poses threats to Europe, but also offers countless opportunities. Any policy response must retain a proper balance, and an understanding not only of losses, but also of gains.

Finding 8. Substitution effects also apply to many online services that are not OTT in the session that they do not compete with traditional *communication* services. They may compete with "brick and mortar" stores, with banks, or (in the case of Uber) with taxi services. The policy questions raised are complex – these new services may be disruptive to existing market players, but they benefit consumers.

In this context, it is important to note that Europe has clearly lost ground to the United States in recent years, but Europe is not an inherently weak player in this space. Europe has significant strengths in manufacturing, for instance – many aspects of the Internet of Things and of smart cars would appear to play to European strengths (as we discuss in section 4). Europe has a good technological base, and a highly educated population.

At the same time, Europe's ability to innovate faces well-known challenges, notably including a society that is not altogether friendly to innovation and entrepreneurship, and a lack of venture capital.[25, 26]

[25] See Karen E. Wilson (2015), How to unleash the financing of high growth firms in Europe, Bruegel, at http://bruegel.org/2015/05/how-to-unleash-the-financing-of-high-growth-firms-in-europe/. "Access to capital is critical for SMEs and start-ups. In particular, growth finance is important for young innovative firms, which are the drivers of growth and jobs in the economy." For the long-standing challenges to European innovation capacity in general, see for instance Andre Sapir et al. (2003), *An Agenda for a Growing Europe*; Esko Aho et al. (2006), "Creating an Innovative Europe: Report of the Independent Expert Group on R&D and Innovation appointed following the Hampton Court Summit", at http://ec.europa.eu/invest-in-research/action/2006_ahogroup_en.htm; and Jonathan Cave, J. Scott Marcus, Kenneth R. Carter, Dieter Elixmann, and Stephen Simmons, "Tuning the

Identifying the best way forward requires a good understanding of our strengths and weaknesses in this regard, and of the threats posed and opportunities offered. Indeed, the opportunities and risks that these developments represent for Europe can best be visualised using a tool known as *SWOT* analysis (for *Strengths, Weaknesses, Opportunities, and Threats*). How could Europe benefit from widespread, integrated use of cloud, big data, and ubiquity in the implementation of e-government and commercial services? How might Europe be hurt?

The *Strengths* and *Opportunities* are positive, while the *Weaknesses* and *Threats* are negative. In this analysis, the *Strengths* and *Weaknesses* are internal, and represent the *inputs* that Europe can bring to bear in seeking to capitalise on online services in general, and OTT services in particular. The *Opportunities* and *Threats* are external, in the sense that they represent the potential outputs of the process, the potential gains and losses that Europe could experience.

Table 1 provides an illustration of the types of issues we consider in greater detail in the study. Perhaps the biggest opportunity in this context are the gains in GDP and (skilled) employment that could be realised both through the development of Europe's digital industries and in the use of technology by citizens and businesses.[27] Clear weaknesses include the fragmentation of regulatory systems and lack of adequate access to venture capital. It is also worth noting that some points can be seen both as strengths and weaknesses. This is particularly the case concerning Europe's cultural diversity, which provides a rich source of content, but hampers cross-border distribution.

Innovation System: Final Report (D4) of the Study of the Impacts of IST-RTD on Key Strategic Objectives Related to Growth and Jobs", a study prepared for the European Commission by RAND Europe and WIK-Consult GmbH, 27 February 2008, available at: http://ec.europa.eu/dgs/information_society/evaluation/data/pdf/studies/s2006_04/final_report.pdf.

[26] Whether the Horizon 2020 programme has corrected the lack of venture capital is debatable.

[27] See for instance Ben Miller and Robert Atkinson (2014), "Raising European Productivity Growth through ICT".

Table 1. SWOT analysis of Europe in capitalising on the migration to online services in general, and OTT services in particular

	Helpful	Harmful
Inputs	**Strengths** • Size of the EU economy. • A large and highly educated, adaptable workforce. • A relatively strong and technologically innovative manufacturing sector. • Increasing speed and capability of devices and services, enhanced price performance (Moore's Law). • Economic and cultural diversity of the EU.	**Weaknesses** • Lack of an entrepreneurial culture. • A society that places a high social and economic price on failure. • Inertia, resistance to process change. • Fragmentation of Europe into Member States with different linguistic, administrative, legal, regulatory, and cultural processes and traditions. • Continuing challenges in access to venture capital. • Lack of leadership at EU level. • Complex and inconsistent taxation. • Gaps in fixed and mobile deployment and adoption of ultra-fast broadband.
Outputs	**Opportunities** • Gains in GDP and *overall* gains in (skilled) employment. • Economies of scale and scope. • Lower unit costs. • Lower transaction costs. • Overall acceleration of business. • Enhanced innovation.	**Threats** • Risks of losing further ground to global competitors. • Negative impact on revenues, profit, and employment for impacted sectors and firms. • Privacy and security risks and breaches. • Risks of lock-in. • Risk of access and service monopolisation.

Source: WIK

Finding 9. The migration to online services in Europe carries not only risks, but also countless opportunities for Europe. Europe is not an inherently weak player in this space. Europe has significant strengths in manufacturing, for instance – many aspects of the Internet of Things and of smart cars would appear to play to European strengths. Europe has a good technological base, and a highly educated population.

Finding 10. As Europeans, we should be seeking (1) to capitalise on our strengths, (2) to mitigate our weaknesses, (3) to guard against the threats where possible, and (4) insofar as possible, to realise the opportunities.

2. CURRENT AND EMERGING BUSINESS MODELS

KEY FINDINGS

- Data on service volumes and usage patterns show that OTT services have firmly entered the communication and audiovisual domains and are challenging traditional services. The largest effect is seen in messaging, where OTT services such as WhatsApp have clearly overtaken SMS. In voice communication and audiovisual media, the growth of OTT services is also very significant.
- Similar competitive challenges brought by the rise of online platforms are beginning to be felt by other traditional industries ranging from taxis to hotels.
- The effect of disruptive entry via online services and platforms is that organisations from previously separated domains now compete with similar services in the converged media-Internet-telecommunications market.
- Many (although not all) of the entrants into OTT markets are US-based, while traditional players are more typically national or European. For example, data suggests that US-based Netflix now accounts for nearly half of subscription video on demand services in Europe.
- In the converged value web, there typically exist multiple paths for the delivery of similar or even identical services and content to consumers. Organisations from previously separated domains now compete with similar services in the converged media-Internet-telecommunications market.
- Most services depend on the availability of assets from multiple organisations. This leads to a multitude of interdependencies between the organisations in the value web. Dependence on the underlying transmission network has been a major focus of discussions to date, but in reality it is only one dependency out of many. The increasing performance of the underlying networks (e.g., the high speeds offered by ultra-fast broadband) and the increasing broadband coverage (e.g., through mobile and satellite) have an important enabling role for innovative applications and new business models.
- Although OTT players provide unmanaged services (no control over access networks), they increasingly take measures to enhance the performance of their service by investing in content distribution infrastructure. This enhances the overall performance of the Internet as experienced by end-users. It also underlines the role that OTT providers play in building a competitive broadband Internet in Europe.

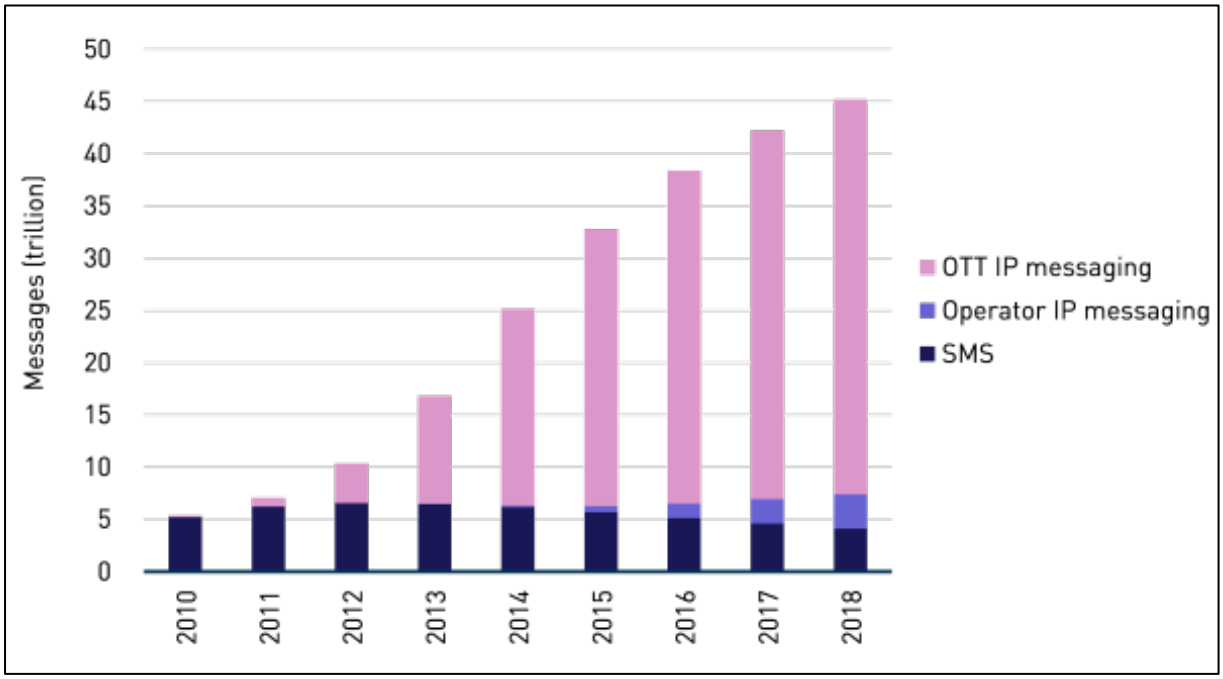
In this chapter, we assess the extent to which traditional telecommunication and audiovisual services may be challenged by OTT applications, and discuss how business models of traditional as well as OTT providers are adapting to the new environment. We also touch briefly on online challenges to other traditional (licensed) industries such as taxis and hotels.

- Section 2.1 looks at usage trends in OTT and the implications for traditional services.
- Section 2.2 investigates the supply side and business models underpinning OTT and other online services and the relationships amongst different parties in the value chain.

2.1. Usage trends in OTT

A clear example of strong take-up of OTT services is provided by mobile messaging. As Figure 9 illustrates, the worldwide volume of messages sent using OTT IP services such as WhatsApp in 2013 exceeded the volume sent using the traditional operator SMS service. Note that only three years earlier, in 2010, the OTT IP messaging volume was still negligible. The strong growth of OTT IP messaging is expected to continue, while the combined volume of network operator provided messaging services (SMS and newer IP-based services) is expected to stabilize.

Figure 9. Volume of messages sent from mobile handsets worldwide, historical development 2010-2013 and projection 2014-2018.

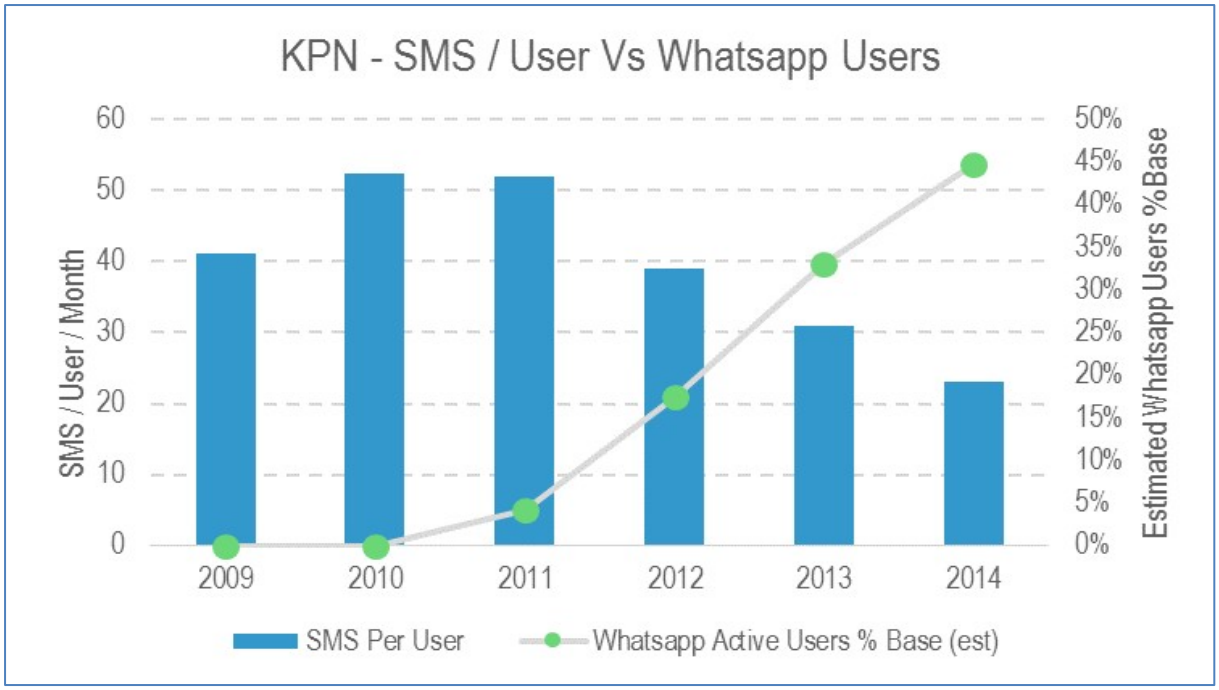


Source: Analysys Mason, 2014[28]

The data for messaging in the Netherlands from network operator KPN strongly suggest a substitution effect of the Whatsapp OTT messaging service on SMS (see Figure 10).

[28] OTT messaging volumes will nearly double in 2014, Analysys Mason, 28 January 2014, available at http://www.analysysmason.com/About-Us/News/Insight/OTT-messaging-volumes-Jan2014-RDMV0/.

Figure 10. SMS volume and number of WhatsApp users at KPN.



Source: STL Partners, 2014[29]

In voice services, one can observe a strong uptake of OTT services in international traffic. In 2013, the international traffic volume carried by Skype, the best known OTT voice service, grew 36 percent to 214 billion minutes[30, 31]. In that same year, the international telephone traffic (both fixed and mobile) carried by telecom operators grew 7 percent to 547 billion minutes. Thus, international voice services also show a strong uptake of OTT services, although the effect is not as overwhelming as in messaging.

An ongoing trend is that OTT voice and messaging are integrated in a range of other applications. For example, in multiplayer online role-playing games (such as World of Warcraft), the participants often communicate through voice and messaging to coordinate their actions. This shows that OTT applications bring voice and messaging to areas outside traditional managed communications.

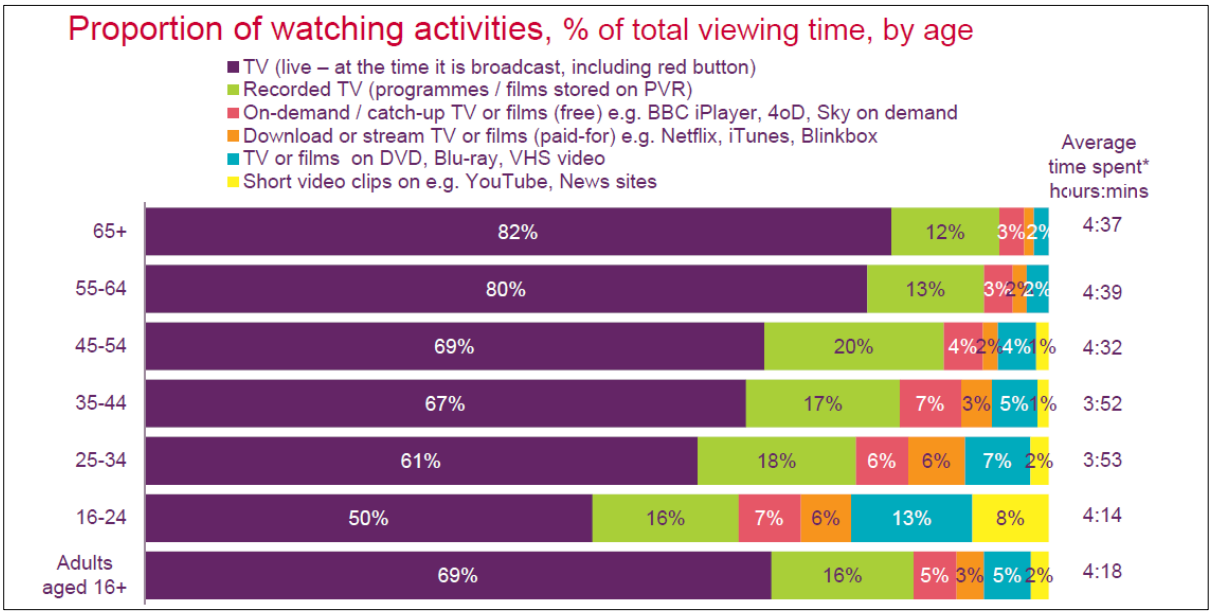
OTT services have also entered the audiovisual domain. Figure 11 shows how viewers in the UK spend their 4 to 4.5 daily hours of watching time. Overall, viewers still spend most time watching traditional live (linear) TV. Across all age categories, but more pronounced among younger viewers, OTT services are making inroads into the viewing behavior. These services are offered by broadcasters (e.g., catch-up TV) and by on-line providers (e.g., Video-on-Demand by Netflix, clips by Youtube). Note that in parallel to the uptake of OTT services, other viewing modes are important as well: TV recordings made by users themselves on personal video recorders and DVDs/Blu-ray discs.

[29] STL Partners (2014), Five Principles for Disruptive Strategy, Executive Briefing, Dealing with Disruption Stream. Available at http://www.telco2research.com/articles/5DisruptivePrinciples. Viewed 2 November 2015.

[30] Skype traffic continues to thrive, TeleGeography, January 2014, https://www.telegeography.com/products/commsupdate/articles/2014/01/15/skype-traffic-continues-to-thrive/

[31] The volume reported for Skype concern Skype-to-Skype calls, where the two (or more) users involved both use a Skype software client.

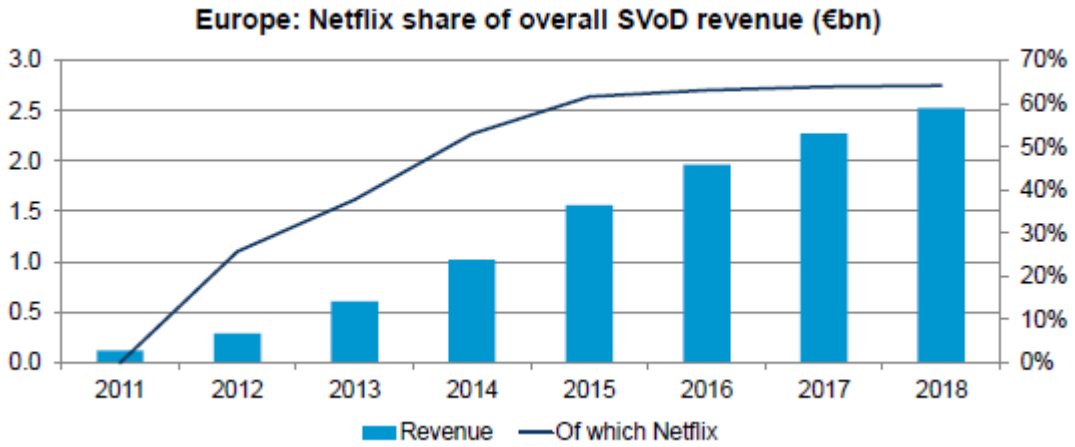
Figure 11. Proportion of watching activities for UK viewers



Source: OFCOM, 2014[32]

Figure 12 examines the growth of Subscription Video-on-Demand (SVoD) in Europe (i.e. services that falls in the orange bars of Figure 11). It shows that the revenues from SVoD services, which are dominated by OTT services, have grown substantially over the past years. The Netflix service accounts for almost half of total SVoD revenues, and this share is expected to rise further according to analyst firm IHS.[33]

Figure 12. Growth of Subscription Video-on-Demand (SVoD) revenues and the Netflix share in it.



Source: IHS (2014)[34]

[32] OFCOM, The Communications Market Report, 6th August 2015, available from http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr15/

[33] IHS, The Future of Television, EBU Knowledge Exchange 2014, September 2014, available from http://www3.ebu.ch/calendar/KX14.

[34] Ibid.

In the US, similar shifts in viewing behaviour can be observed. Cable television viewing in the US was down 12.7% year-over-year in January according to Nomura Research, one of the biggest losses since Nomura began studying the market. "It's services like Netflix, Amazon Instant Video, and Hulu that are greedily grabbing viewers away from traditional TV".[35]

Finding 11. The data on service volumes and usage patterns show that OTT services have firmly entered the communication and audiovisual domains and are challenging traditional services. The effect is readily visible in messaging, where OTT services such as WhatsApp have clearly overtaken SMS. In voice communication and audiovisual media, the growth of OTT services is also very significant.

2.2. The supply side: evolving value chains

Underlying these retail trends, is the convergence between media, Internet and telecommunications, which has brought many new services, devices and distribution models.[36,37]

In the following sections, we analyse the interactions between various Content and Application Providers (CAPs) and other companies in three key OTT areas: *voice, messaging*, and *video and music*. A similar exercise could be conducted for other online services such as search and social networking; however, given our focus on OTT services, we have not done so in this study.

In our analysis, we use many examples of companies involved in the provision of content and applications. Note that the examples and the company logos shown are only for purposes of illustration, in that one can think of many other examples involving other companies. Furthermore, all trademarks and logos are the property of their respective owners.

2.2.1. OTT versus traditional services in voice communications

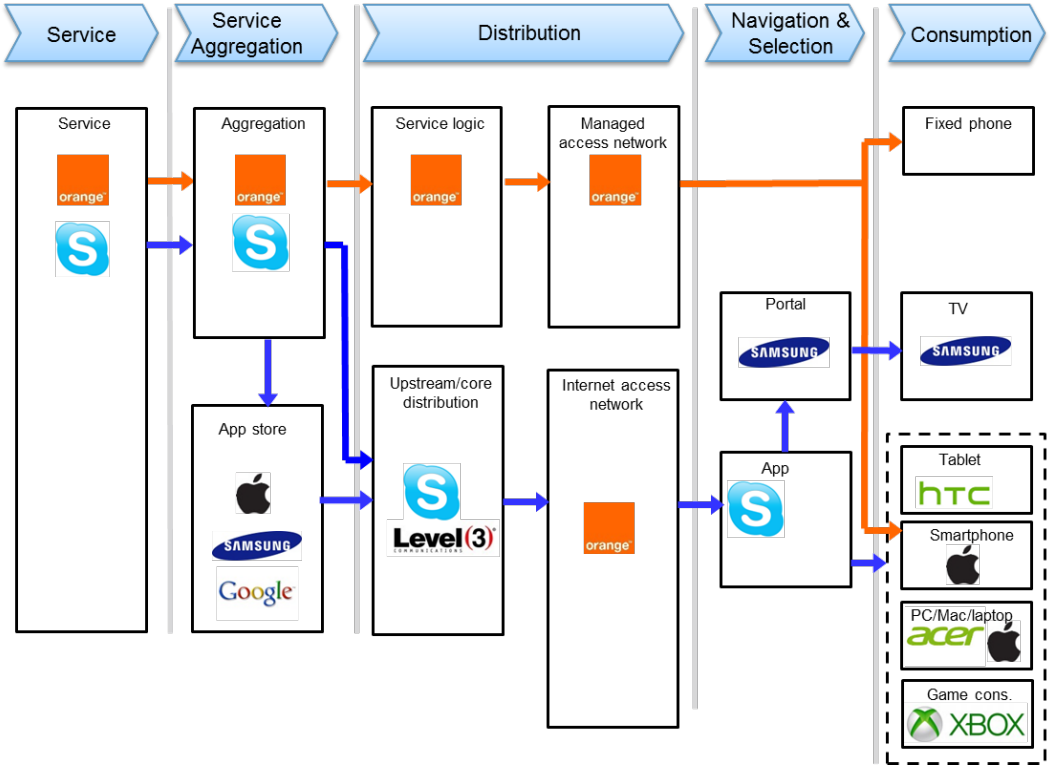
We start with a high-level comparison of Skype voice communications and the fixed and mobile voice services offered by Orange in Figure 13. Skype serves as an example of a company providing on-line voice, other examples would be Viber and Line. Similarly, Telefonica, KPN and other companies could be used as an example instead of Orange.

[35] Friend or foe: OTT and pay TV services (2015), Available at http://www.digitaltveurope.net/410341/friend-or-foe-ott-and-pay-tv-services/. Viewed 2 November 2011.

[36] OECD (2012), "The Development and Diffusion of Digital Content", OECD Digital Economy Papers, No. 213, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/5k8x6kv51z0n-en

[37] OECD (2014), "Connected Televisions: Convergence and Emerging Business Models", OECD Digital Economy Papers, No. 231, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/5jzb36wjqkvg-en

Figure 13. Voice communication offered by Orange (in orange) and Skype (in blue).[38]



Source: TNO, 2015

As can be readily seen from the figure, the converged media-Internet-telecommunications value web brings together many companies from different backgrounds.[39] We use the term *value web* rather than *value chain*, because a key outcome of convergence is that there are multiple, parallel paths that services take between the service provider and the customer who consumes the service.

- The voice services by Orange are often characterised as managed. In the left-hand side of the figure, Orange offers the *service*,[40] i.e. it has the commercial relationship (typically in form of a subscription) with the customer. Moving to the right, Orange *aggregates* the services (for instance, fixed voice in a triple play bundle with internet and television, or mobile voice in a bundle with mobile data and SMS). Then Orange *distributes* the services over its own fixed and mobile networks. These networks are managed in the sense that there can be a guaranteed reservation of network capacity for the services. On the right-hand side, the services are *consumed* by customers. This calls for suitable devices, such as a traditional fixed phone or smart phone.

[38] Note once again that services and company logos are shown only for purposes of illustration.

[39] See also F. Berkers et al, DAMIAN: A new methodology for analysing value networks and regulation in converging markets, COMPETICON 2015, Copenhagen, January 19-20, 2015; P.A. Nooren et al (2014), Regulation in the converged media-internet-telecom value web, TNO Report R11428, October 2014 http://publications.tno.nl/publication/34611843/NhocfJ/TNO-2014-R11482.pdf

[40] The *italicised terms* in this paragraph refer to the main activities indicated in the value chain at the top of Figure 13.

- The Skype voice takes a typical online path (in blue). Skype offers the application[41] that aggregates voice communication with messaging and video conferencing. Skype is provided through apps and software. For smartphones and smart TVs, the app is available from app stores, such as the Apple app store and the Samsung app store. For PCs, the software can be downloaded from the Skype website. For distribution, Skype relies on a combination of its own cloud infrastructure and the internet. Skype is delivered via Skype's own cloud infrastructure[42,43] (and possible other core networks offered by companies like Level3) and the internet access networks provided by the customer's Internet Service Provider (ISPs). We assume that the consumer has a triple play package from Orange, so the online applications such as Skype are delivered to the consumer over the Orange internet access network, both fixed and mobile. The Internet access network offers a so-called best-effort connectivity, meaning that the quality is usually good but not guaranteed, as there is no reservation of network capacity for Skype. Skype has been designed to perform well and provide good quality, also during situations where the bandwidth available to Skype is limited and fluctuating. Moving to the right, consumers can choose from many devices to use Skype, such as PCs, tablets, smartphones. The Skype app is also available for Samsung smart TVs and for the Xbox game console.

The example shows that in parts of the value web outside the Internet access network, Skype can actively control the bandwidths available where it uses its own infrastructure. OTT services can take measures at the network level to achieve a good quality for end users*. It is only in the Internet access part that the difference between managed and best-effort connectivity appears.*

[41] Skype's characterization of its own activities is interesting and relevant for this study. Skype consistently states that it provides *software* that provides certain *features and products*. In this way, Skype does not position itself as a *service provider*.

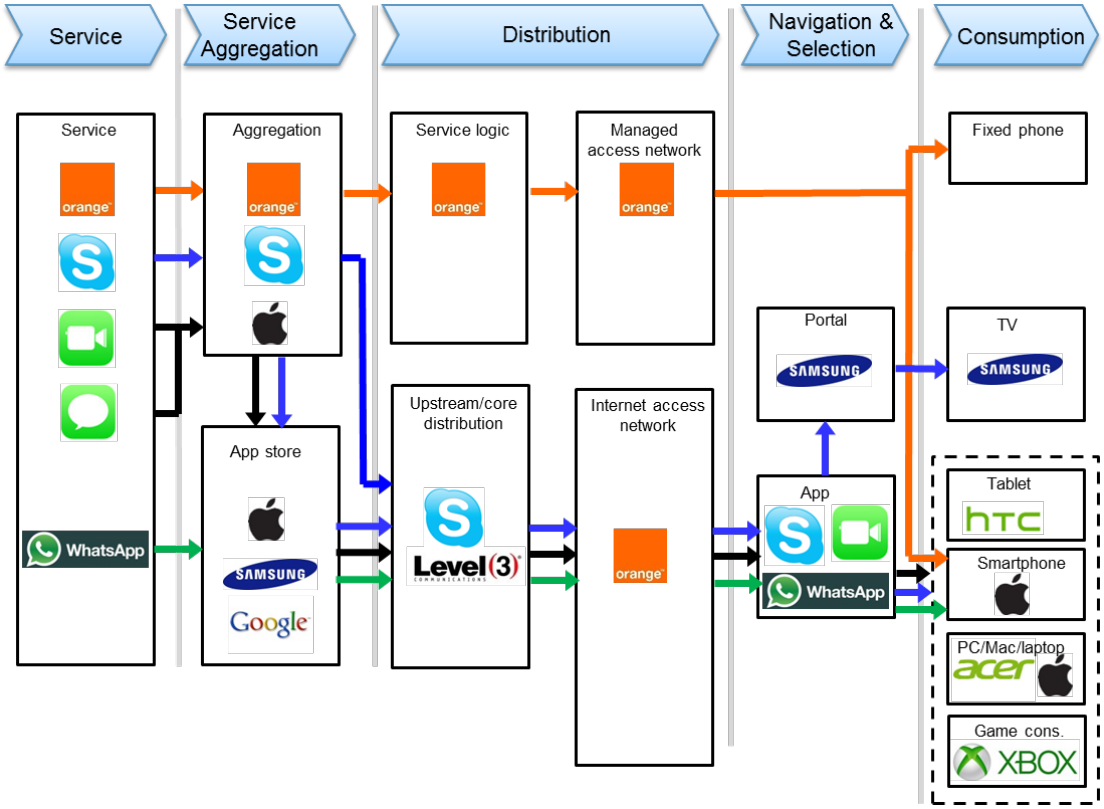
[42] As described in the Skype support section on Cloud infrastructure. See https://support.skype.com/en/faq/FA12381/what-is-the-cloud. Viewed 2 November 2015.

[43] Update on Skype cloud strategy in the company blog (2013). See http://blogs.skype.com/2013/10/04/skype-architecture-update/. Viewed 2 November 2015.

2.2.2. OTT versus traditional messaging and video communication business models

In Figure 14, we expand the picture by adding *messaging and video communication* services not only from Orange and Skype, but also from Apple and WhatsApp.

Figure 14. Voice, video and messaging communication services offered by Orange (in orange), Skype (in blue), Apple (black) and WhatsApp (green).[44]



Source: TNO, 2015

The customers of Orange's mobile voice services can use the standard SMS service. Apart from voice communications, Skype also offers messaging and video communication. The WhatsApp path (in green) is similar to the Skype path. Unlike Skype, WhatsApp is only available on smart phones, as it relies on the mobile phone numbers used in the traditional mobile voice and SMS service that the customer receives from Orange in this example[45]. Recently, WhatsApp added voice communication to its well-known messaging application. The paths for Apple's Facetime and iMessage services (in black) are also similar to those of Skype. A key difference, though, is that Apple can use its own app store for distribution of the apps, and can pre-load the apps onto its iPhones and iMacs.

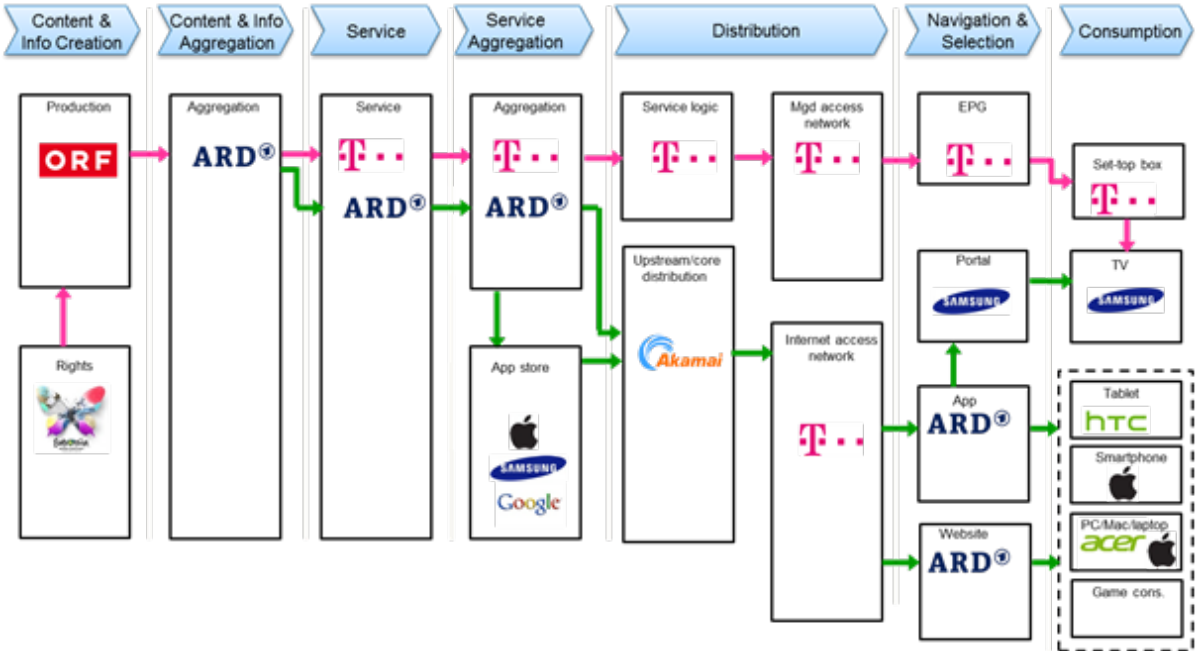
2.2.3. Audiovisual media

Figure 15 shows a number of paths for media services, using the catch-up videos of the Eurovision Song Contest as an example. For media services, the value web is extended

[44] Services and company logos are shown only for purposes of illustration.
[45] Since early 2015, WhatsApp offers access to its service from web browsers as well, but only as an extension to existing accounts on smartphones, see http://www.whatsapp.com/faq/en/web/28080003.

with two further activities not found in communication services: the content creation and content aggregation on the left-hand side of the figure.

Figure 15. Managed and online delivery of catch-up television content from the Eurovision Song Contest. The managed service (in pink) is provided by Deutsche Telekom, the online service (in green) by ARD.[46]



Source: TNO, 2015

We use the example of German viewers of the Eurovision Song Contest. In the *content and info creation* zone on the left, the figure shows a single pink path for the Eurovision content starting from the European Broadcasting Union (EBU) that owns the rights to the Eurovision song contest format. The 2015 edition has been produced by the Austrian public broadcaster ORF. In Germany, the song contest was broadcasted live by the public service broadcaster ARD. In order to do so, ARD has aggregated the song contest together with other television programs on one of its linear television channels (*content & info aggregation*). After the live broadcast has occurred, the videos from the contest can be distributed along managed and online paths.

- The first path, in pink, is a managed path. Here, a television service provider, such as Deutsche Telekom (DT) in Germany, offers a catch-up *service* as a part of its digital IPTV package. The consumer buys access to the catch-up service through a TV subscription, which is often part of a triple-play offer that combines TV, Internet access and telephony *(service aggregation).* DT *distributes* the catch-up TV using its own TV platform and managed network. Here, *managed* again means that there is a guaranteed reservation of network capacity for the distribution of the catch-up TV service. The consumer can *navigate & select* the catch-up TV videos from the Electronic Program Guide (EPG) running on a media box (often called a Set-Top Box) supplied by DT. In this example, the media box is connected to a smart TV from Samsung that a consumer uses to watch the video *(consumption)*.

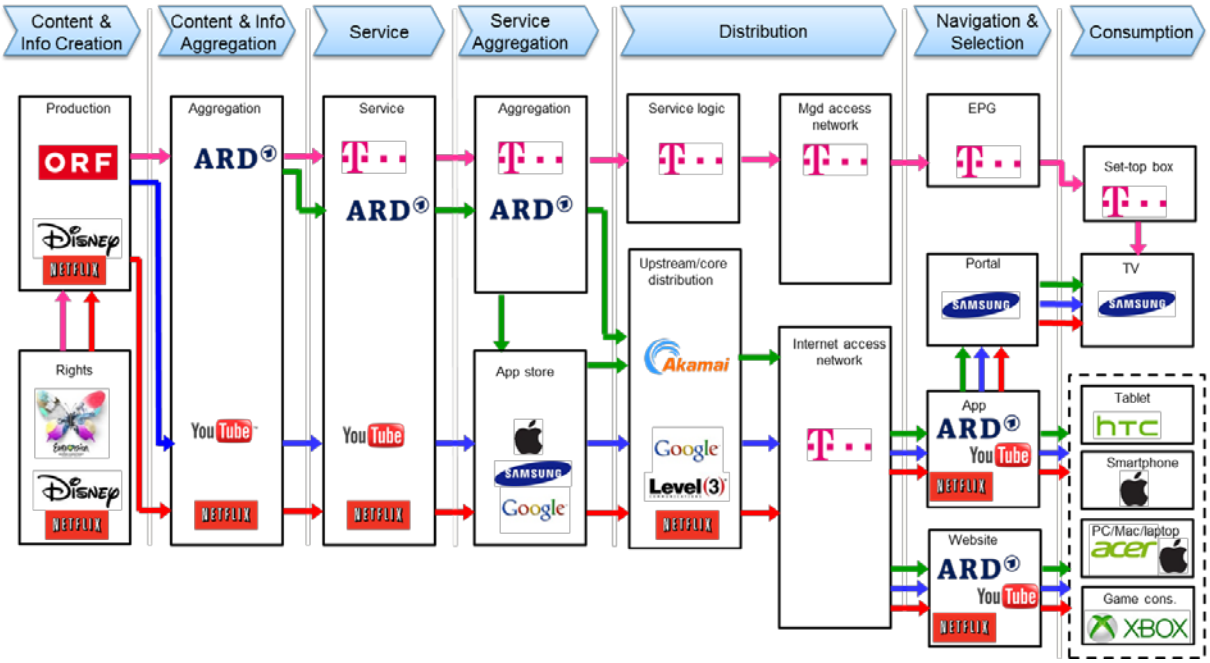
[46] Services and company logos are shown only for purposes of illustration.

- The second path is an online path, shown in green. In this path, users go to the ARD website to access the catch-up service. Thus, the end-user *service* is offered by the broadcaster, ARD, rather than by the TV service provider, DT. ARD also offers this service via apps for a variety of smartphones, tablets and smart TVs. Consumers typically download the app they need from the app store associated with their device's operating system. In this context, app store providers, such as Apple and Google, are also service aggregators in the sense that they offer many different services in a uniform way in their stores. For the purpose of this example, we assume that ARD uses the Akamai Content Delivery Network (CDN) for playing the videos. We also assume that the consumer has a triple-play package from DT, so that the ARD's catch-up video is delivered to the consumer over the DT Internet access network. Note that in this triple-play example, the DT network provides the connectivity for both the managed path and the online path to the consumer's home. As seen earlier, the Internet access network offers a so-called 'best-effort connectivity', meaning that the quality is usually good but not guaranteed, as there is no reservation of network capacity for the catch-up videos. In other parts of delivery, ARD and Akamai can actively control the capacity available for the services through their own infrastructures. Consumers can choose from many devices to navigate, select and view online catch-up TV. They can watch videos by visiting the ARD website on their PC, laptop or tablet or download the ARD app for their smartphone or tablet. There is also an ARD catch-up TV app for the Samsung smart TV. And, of course, within one household, two or more of these modes of consumption can be used in parallel.

The catch-up TV services offered by TV service providers and broadcasters already lead to a rich set of possible paths and consumption modes. However, the set of paths in Figure 15 is by no means exhaustive. For example, many TV service providers also bring their catch-up service to tablets and smartphones, using their Internet access networks to stream video from their TV platforms to their apps running on these devices. Furthermore, the online paths can also be provided over mobile networks, adding mobile network providers to the value web.

Figure 16 shows yet another relevant path (in blue): catch-up videos from the Eurovision Song Contest are also available on YouTube via a dedicated Eurovision 2014 channel.

Figure 16. Delivery of catch-up television and VoD services by Deutsche Telekom (in pink), by ARD (green), YouTube (blue) and Netflix (red).[47]



Source: TNO, 2015

Thus, a third service provider for this content is available in parallel to the two discussed earlier: consumers can watch the Eurovision videos by visiting the YouTube website or by using the YouTube app for their smartphone, tablet or smart TV. In the YouTube path, the videos are played out from Google's global cloud infrastructure and distributed further over the Internet access network.

Finally, Figure 16 shows a path for Netflix (in red), as an example of an online VoD provider. Netflix aggregates content from multiple content providers (e.g. Disney) and self-produced content into an online catalogue. Netflix distributes its videos to the Internet access networks using a combination of its own global infrastructure and content delivery networks provided by others (*e.g.* Level3). The Netflix VoD service competes with other online VoD services that follow paths similar to the red one. Online VoD providers also compete with VoD services provided by TV service providers.

Music services have developed in a way that is roughly similar to video services. As a complement to traditional radio stations and online stores like iTunes, a series of streaming audio services emerged, such as Spotify and Deezer. The delivery paths of these services is roughly comparable to Netflix. Spotify acquires the rights from music labels like EMI, Warner, Universal and The Orchard, aggregates them in an online catalogue and streams the audio to its customers, who have a wide choice of devices.

[47] Services and company logos are shown only for purposes of illustration.

2.2.4. Key observations on the dynamics of the converged value web

We would like to highlight the following important observations that flow from the analysis in the Section 2.2:

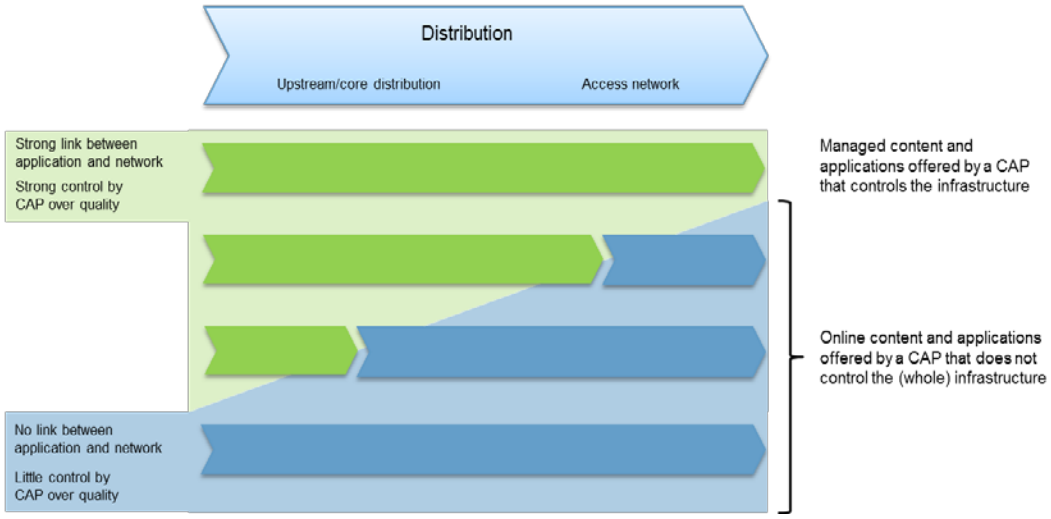
Finding 12. In the converged value web, there typically exist multiple paths for the delivery of similar or even identical services and content to consumers. Organisations from previously separated domains now compete with similar services in the converged media-Internet-telecommunications market.

Finding 13. Most services depend on the availability of assets from multiple organisations. This leads to a multitude of interdependencies between the organisations in the value web. Dependence on the underlying transmission network had been a major focus of discussions to date, but in reality it is only one dependency out of many. The increasing performance of the underlying networks (e.g. the high speeds offered by ultra-fast broadband) and the increasing broadband coverage (e.g. through mobile and satellite) have an important enabling role for innovative applications and new business models.

As is apparent from Figure 13 through

Figure 16, the larger providers of OTT services often also play a role in the distribution of their applications, either through infrastructure that they deploy themselves or by buying cloud and network capacity from other providers. The degree to which OTT service providers move into distribution depends on their scale and their respective business models (see Figure 17). For the last part of the distribution over the broadband access networks, they currently always rely on the Internet access networks provided by network operators (ISPs). In the case of OTT providers that have an extensive distribution infrastructure themselves, the key difference between managed and best-effort connectivity only appears in the Internet access part.

Figure 17. Many online service providers increase their control over the distribution and quality by using their own infrastructure.



Source: TNO, 2015

Finding 14. In online services, the trend among large providers over the years has been to roll out their own cloud infrastructure or Content Delivery Networks, or to buy capacity on other providers' clouds or CDNs to distribute their services from locations closer to the end user. This gives the online providers more control over the distribution and the quality of their services.

3. TRENDS IN MEDIA AND COMMUNICATION SERVICES

KEY FINDINGS

- In the coming 10 years next generation media technologies, devices, wearables and IoT-related platforms will create important new *opportunities* for content and application providers, including European firms *to* ***deliver highly innovative, in some cases disruptive, services over the Internet***.
- Ubiquitous and ultra-fast mobile and satellite Internet connectivity such as those delivered through 5G and software-defined networks will enable advanced internet services that require stability and minimal lag such as ***communication between autonomous vehicles and advanced smart city applications***.
- The costs of content and service creation will continue to decrease rapidly, especially in terms of software (with open source, modular building blocks and cloud storage and processing).
- **Access to and control over data will become important strategic assets to create and capture value**;
- Concerns over the 'privacy paradox' remain, but growing popularity of privacy enhancing technologies such as adblockers indicate that consumers are increasingly active in protecting privacy.

This section discusses the future outlook for the OTT sector. It focuses on key trends[48] affecting the creation, aggregation, distribution, navigation and consumption of content and services in the near term and looking forward towards 2030.

Emerging technologies and co-evolving social norms and business practices are broadening the content and online services value web both in scope and in the number of players. Data from connected devices, wearables, smart cars and other intelligent objects of the emerging Internet of Things (IOT) will populate new content and services models. ***Companies like Uber and AirBnB are leading the first wave of digital services startups*** redefining service delivery models in traditional sectors as transport and property rental. In this section we will focus on services concerned with media and communication by investigating developments across the content value web from creation to consumption.

3.1. Medium term outlook on OTT looking forward towards 2020

Internet traffic is forecast to continue on its dramatic growth path, reaching 168 Exabytes per month by 2020.[49] ***According to Cisco projections, by 2019 eighty percent of IP traffic will be via mobile and wireless connections. Cisco estimates Internet video to represent 64% of total internet traffic by 2019***, up from 46% in 2014.[50]

[48] See for instance: http://www.gartner.com/newsroom/id/2819918; http://singularityu.org; http://technologytrendsindex.kpmg.nl/#MediaEntertainment; or https://hbr.org/2015/01/the-tech-trends-you-cant-ignore-in-2015; or

[49] Cisco VNI (2015), Global IP traffic forecast. Available athttp://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/VNI_Hyperconnectivity_WP.html. Viewed 2 November 2015.

[50] Cisco VNI (2015), op. cit.

Figure 18. Global Internet Traffic forecast

Source: Cisco VNI Global IP Traffic Forecast, 2014–2019

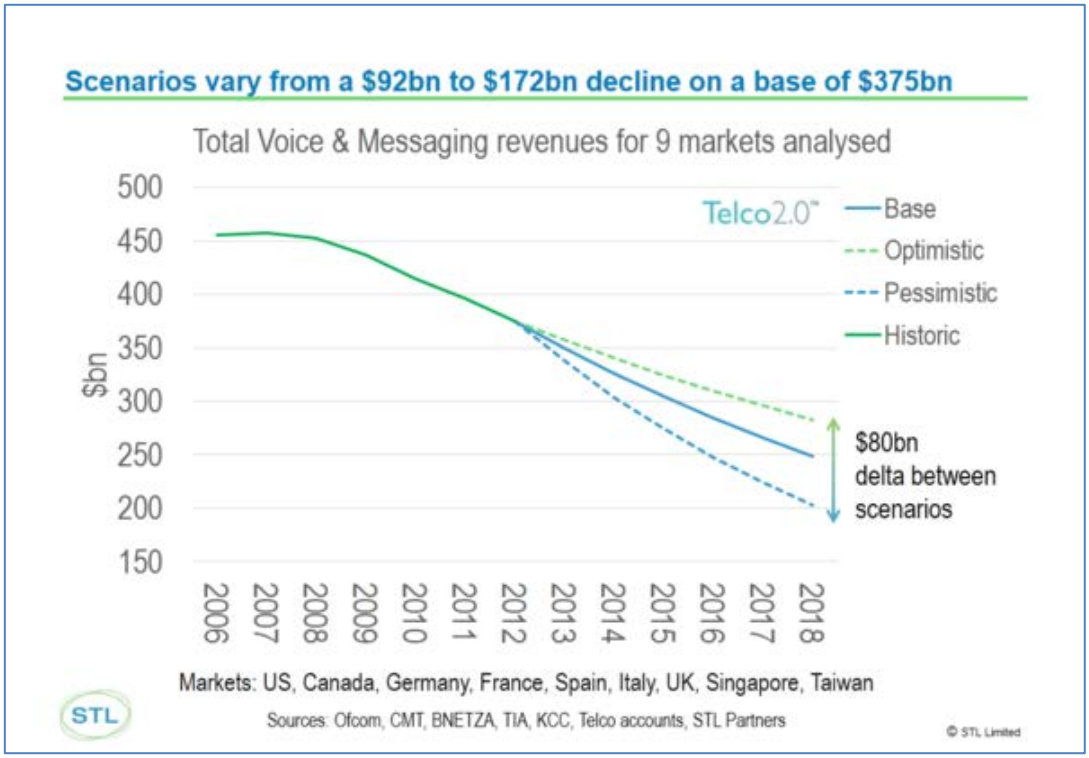
Global online TV and video revenues will reach US$ 42.34 billion in 2020 according to a report from Digital TV Research[51]. The US will remain the dominant OTT TV territory for online TV and video revenues, according to the Global Online TV & Video Revenue Forecasts report; however, its share of total revenues will drop from 59% in 2010 (when the US recorded revenues of US$ 2,326 million) to 37% in 2020 (US$15,527 million) as international markets catch up. China's online television and video revenues will soar from just US$ 37 million in 2010 to US$ 3,033 million in 2020, pushing China up to third place in the world rankings (with Japan in second place). Online television and video subscription revenues will contribute 40% of total OTT revenues in 2020, up from 27% in 2010.

Video was the main driver of 21% annual growth in data traffic in 2014.[52] In the USA, almost 25% of television is watched on demand by non-millennials, and for millennials this is even 45%, more than the percentage that watches live television (41%)[53]. Television is increasingly consumed in combination with other devices. According to a Nielsen survey, over 80% of American viewers uses smartphones or tablets while watching television, for instance to discuss a particular program with friends (29%) or reading comments about the program on social media (18%), but they also consume many other OTT services.

OTT messaging is expected to dominate messaging towards 2020 approaching 90% of the total messaging market (see Figure 9 in Section 2.1). ***OTT Voice and Messaging can be expected to continue to affect revenues from traditional telecommunication services*** (see Figure 19).

[51] See http://www.satellitemarkets.com/market-trends/ott-revenues-reach-us-42-billion-2020.
[52] Mary Meeker (2015), "Internet Trends 2015", slide 13, based on Cisco VNI (2015).
[53] Shontell, A. (2014) Mary Meeker's Stunning 2014 Presentation On The State Of The Web. Slide 121. Available via: http://www.businessinsider.com/mary-meekers-2014-internet-presentation-2014-5?op=1&IR=T&IR=TT. Viewed 2 November 2015.

Figure 19. Declining revenues in traditional telcommunication services.



Source: STL[54], 2014

3.2. Long term perspectives looking forward towards 2030

The evolution of OTT services in the long run will be further enabled by the emergence of next generation media technologies and new, exponential business models. In the balance of this chapter, we review the ways in which key innovations are likely to impact upon the content and media value chain from creation all the way to consumption.

3.2.1. Creating content and applications

New digital technologies inspire new types of content such as *augmented reality* and *virtual reality*. Although these technologies have been around for some time[55], recent activities of global players like Facebook, Microsoft and Google are bringing new momentum. In March 2014, Facebook acquired Oculus Rift, while in June 2014 Google introduced its low-tech and affordable virtual reality kit Cardboard[56]. New players such as Avegant[57] are planning to enter this market as well. In January 2015, Microsoft presented Hololens[58], an augmented reality platform that projects an additional information layer on the real world.

---

[54] STL Partners, The Future Value of Voice and Messaging (2015). Available at http://www.telco2.net/blog/2013/11/telcos_could_lose_up_to_172bn.html. Viewed 2 November 2015.

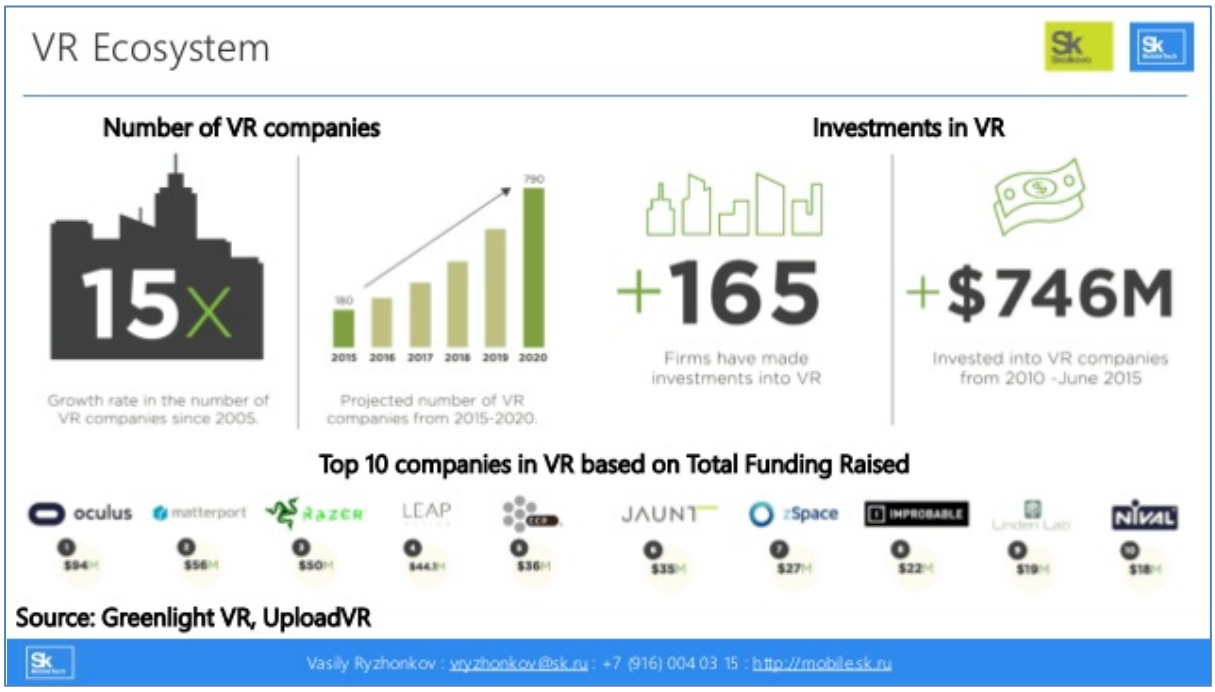
[55] Robertson, A. and Zelenko, M. (eds.) Voices from a Virtual Past: An oral history of a technology whose time has come again. Available via: http://www.theverge.com/a/virtual-reality/intro

[56] According to the description on the Google Cardboard product page. See https://www.google.com/get/cardboard. Viewed 2 November 2015.

[57] As described on the Avegant Glyph updates blog. See http://avegant.com/blog. Viewed 2 November 2015.

[58] See the Microsoft Hololens productpage at https://www.microsoft.com/microsoft-hololens/en-us. Viewed 2 November 2015.

Figure 20. The VR Ecosystem



Source: Ryzhonkov[59] (2015)

Both Hololens and Oculus Rift are based on proprietary hardware, whereas Cardboard is based on the use of smartphones. All three technologies allow other parties to build new services on top of them, providing new opportunities for content and service developers. The platforms are particularly suitable for gaming and simulation; in addition, many other types of content services are also possible[60].

In addition to VR and AR, wearables such as smart watches and smart cars also provide new platforms for content and service creation. One example of this is 'glance journalism'[61] – journalism tailored to new, very brief moments of news consumption, which requires new ways of presenting information. Technical capabilities such as these may enable a new breed of content services.

Digital production processes in combination with highly granular insights in user behaviour and preferences based on *advanced data analytics will continue to drive personalised content creation*. The principle is already visible in advertising, but could make the transition to other kinds of content creation. Broadcasting company RTL is experimenting with news bulletins that adapt to user preferences in its selection of news items[62]. Personalization is also key in content aggregation services such as Facebook or Netflix (see 2.4.2); however, ***more extreme forms (hyper-personalisation) of***

[59] Vasily Ryzhonkov (2015), Slideshare presentation. Available at http://www.slideshare.net/VRyzhonkov/the-rise-of-vr-ar-era-why-this-time-is-different. Published on 27 September 2015. Viewed 2 November 2015.

[60] For instance in B2B settings where professionals are supported via augmented reality, like oil drilling platforms, see: http://www.fastcompany.com/3031171/the-surprising-reason-oil-companies-love-google-glass

[61] Shanoff, D. (2014) Wearables could make the "glance" a new subatomic unit of news. Available via: http://www.niemanlab.org/2014/09/wearables-could-make-the-glance-a-new-subatomic-unit-of-news/

[62] See for a demonstration of RTL News Genius: https://www.youtube.com/watch?v=jRP92wweXXM.

adjusting content based on the preferences of individual users could become central in content creation towards 2025-2030[63].

Data analytics also help guide the *selection of content to be created*. Netflix utilizes the vast datasets it collects from its users and their interaction with the content to determine what new titles they should acquire or produce themselves[64]. Advancements in artificial intelligence also enable the ***automation of content creation***. 'Bots' are already able to write simple news items[65] or compose songs[66], and to assist content producers in their research. Considering the exponential growth of ICTs (and particularly the generation of data and the tools to process them), the capabilities of these kinds of innovations are expected to increase rapidly towards 2025-2030[67].

Finding 15. In the coming 10-15 years next generation media technologies, devices, wearables and IoT-related platforms will create important new opportunities for content and application providers, including European firms to deliver ***highly innovative, in some cases disruptive, services*** over the Internet.

3.2.2. Aggregating content and applications

Current dominant service aggregators have emerged from the PC ecosystem (Microsoft) the smartphone and tablet ecosystem (the App Store from Apple and Google Play from Google), and also from the Smart TV ecosystem, with players such as Samsung, Sony, Google, Apple, Microsoft and Roku, to name just a few[68]. As the Internet of Things expands, new platforms emerge, ranging from watches and wristbands to clothes, cars, homes, electrical grids and much more[69]. Each of these new 'platforms' has the opportunity to function as an aggregator for new services running on top of the platform[70]. This can be in combination with a smartphone. Fitbit and Jawbone wristbands, for example, do not have displays of their own.

The activities of players like Apple[71], Amazon[72], Google[73] and Microsoft[74] in home automation, transport and health show how digital service platforms are invading and

[63] See for instance: King, R. (2013) Marissa Mayer: Yahoo's future is personalization for content, advertising. Available via: http://www.zdnet.com/article/marissa-mayer-yahoos-future-is-personalization-for-content-advertising/; or Soojian, C. (2015) 2015: The Year of Personalized Content. Available via: http://www.socialmediatoday.com/marketing/2015-03-23/2015-year-personalized-content

[64] Leonard, A. (2013) How Netflix is turning viewers into puppets. Available via: http://www.salon.com/2013/02/01/how_netflix_is_turning_viewers_into_puppets/

[65] Roberts, S. (2014) Automated content: Can algorithms write your content for you? Available via: http://futurecontent.co/automated-content-can-algorithms-write-your-content/

[66] Steiner, C. (2012) Can creativity be automated? Available via: http://www.technologyreview.com/news/428437/can-creativity-be-automated/

[67] See for instance: Steiner, C. (2012). Automate This: How Algorithms Came to Rule the World. London: Penguin Books; or Brynjolfsson, E. and McAfee, A. (2014) The Second Machine Age. W. W. Norton & Company. New York; and Ford, M. (2015) Rise of the Robots: Technology and the Threat of a Jobless Future. Persus Books Group. New York.

[68] Patel, N. (2012) Over the top: the new war for TV is just beginning. Available via: http://www.theverge.com/2012/11/12/3633984/future-of-tv-over-the-top

[69] See for a selection of Internet of Things startups: https://angel.co/internet-of-things

[70] There are many authors reporting on this trend. See for example: http://www.economist.com/news/special-report/21593583-proliferating-digital-platforms-will-be-heart-tomorrows-economy-and-even ; http://techtrends.accenture.com/us-en/digital-platform-ecosystems.html or http://dupress.com/articles/platform-strategy-new-level-business-trends ; https://www.accenture.com/us-en/blogs/blogs-over-the-top-start-ups.aspx; and https://hbr.org/2006/05/creating-new-growth-platforms .

[71] When Apple showed off HomeKit in 2014, it announced partnerships with many manufacturers, such as iHome, Haier, Withings, Philips, iDevices, Belkin, Honeywell, and Kwikset. See https://developer.apple.com/homekit/ .

embracing new domains. This provides opportunities for digital services SMEs and start-ups that can benefit from the infrastructure, reach and marketing power of these large platform providers[75,76]. This creates a ***dependency on the platform providers that might possible be a cause for concern in the future***. Depending on the level of interoperability and on the footprint of the new aggregation platforms, ***start-ups and SMEs may have to develop multiple versions of their applications to reach potential customers***.

In the agricultural sector, where data is increasingly being collected via sensor-equipped machines and apps from multiple manufacturers with proprietary cloud solutions, new initiatives from incumbents, start-ups and the open source community aim to integrate agricultural datasets allowing third parties to deliver digital services leveraging the linked datasets provide new valuable insights to farmers[77].

3.2.3. Distributing content and applications

New network technologies such as mobile 5G and software-defined networks can be expected to enable advanced services that require stability and minimal lag, such as communication between autonomous vehicles and advanced 'smart city' applications[78]. ***These trends in network technology are expected to drive a growth in the number and diversity of advanced, tailored IP connections that cater to the needs of specific sectors and applications***. This implies that compared to today, where end users use one generic Internet access service for all of their applications, access services might become more diverse. The current best-effort Internet access service will remain crucial. At the same time, new approaches for the provision of IP connections, both technically and commercially may lead to discussion and tensions between the interests of network operators and online service providers. Furthermore, Google (with Loon[79]) and players from the financial industry[80] are developing and implementing their own proprietary network infrastructures and Internet services provisioning arrangements. In the past, such discussions focused on communication and media services where online providers offer services that compete with operator services; however, *future discussions are expected to be different as they often involve sectors where broadband network operators do not have an established position, such as mobility, energy and health.*

---

72 See for example the description of Amazon Echo on Wikipedia. Available at https://en.wikipedia.org/wiki/Amazon_Echo. Viewed 2 November 2015.

73 Miller, R. (2015) Google announces Brillo, an operating system for the Internet of Things. Available via: http://www.theverge.com/2015/5/28/8677119/google-project-brillo-iot-google-io-2015

74 Microsoft has a range of new products and services centered on the Connected Home. See http://www.microsoftstore.com/store/msusa/en_US/cat/Connected-home/categoryID.67937100. Viewed 2 November 2015.

75 Brown, S. (2014) Homekit, Thread bring app dev to the center of Smart Home success. Available via: http://www.wired.com/2014/09/homekit-thread-smart-home/

76 Hunckler, M. (2015) Internet of Things: Opportunities for Apple, Startups, and More. Available via: http://www.forbes.com/sites/matthunckler/2015/05/15/internet-of-things-opportunities-for-apple-startups-and-more/

77 TNO (2015) Data-driven innovation in agriculture: Case study for the OECD KBC2-programme. TNO 2015 R10154.

78 Next Generation Mobile Networks Alliance (2015), NGMN Whitepaper on 5G. Available at https://www.ngmn.org/uploads/media/NGMN_5G_White_Paper_V1_0.pdf.

79 See the Google Loon description on the product website http://www.google.com/loon/.

80 See for instance Lewis, M. (2014) Flash Boys: A Wall Street Revolt. New York: W.W. Norton & Company.

Finding 16. New mission critical services that demand stability and minimal lag may increase the proportion of ***dedicated IP connections tailored to the needs of specific applications*** which carries the risk of fragmenting the Internet.

Another important trend for distribution is the plummeting unit cost of networking (annually by 27% from 1990 to 2013), cloud storage (annually by 38% from 1990 to 2013) and processing (annually by 33% from 1990 to 2013, which means from 529 dollar per gigabyte to 0,02 cents per gigabyte)[81]. Services like Netflix do not stream their content centrally from one single location, but rather on a decentralized basis using multiple distributed servers closer to their users to store and distribute content from a location close to the user.[82, 83] The availability of scalable and affordable cloud services, following Moore's law, has enabled these new kinds of practices to be feasible and affordable for more and more players.

Finding 17. The costs of content and service creation continue to decrease rapidly, especially in terms of software (with open source, modular building blocks and cloud storage and processing).

In addition to these technological infrastructures and their impact in distribution, ***new business practices also influence the distribution of services and content***. For instance, Apple (with its Newsstand), Facebook (which recently introduced its new 'instant' mode to host and present news articles[84]), and Twitter with its users sharing content, are important channels for the distribution of content[85].

Finding 18. Emerging network technologies such as mobile 5G and software-defined networks are expected to enable advanced services that require stability and minimal lag, such as communication between autonomous vehicles and advanced 'smart city' applications.

3.2.4. Navigating and selecting

Personalization is becoming key to navigation and selection, making big data and data analytics a key ingredient in the way content and services are being presented[86]. Historic, aggregated data from millions of user interactions is employed to provide highly personalized experiences. Facebook uses algorithms to determine what posts (and advertisements) it should show each individual user. Amazon and Netflix use their vast databases, cross referencing the actions of individual users with similar actions and preferences of others to present their recommendations. Google uses data analytics to anticipate what its users are searching for by automatically suggesting queries when

---

81 Shontell, A. (2014) Mary Meeker's Stunning 2014 Presentation On The State Of The Web. Slide 96. Available via: http://www.businessinsider.com/mary-meekers-2014-internet-presentation-2014-5?op=1&IR=T&IR=T.

82 Adhikari, V.K.; Yang Guo; Fang Hao; Varvello, M.; Hilt, V.; Steiner, M.; Zhi-Li Zhang, "Unreeling netflix: Understanding and improving multi-CDN movie delivery," *INFOCOM, 2012 Proceedings IEEE* , vol., no., pp.1620,1628, 25-30 March 2012, doi: 10.1109/INFCOM.2012.6195531

83 For a brief description of Netflix infrastructure partnering activities see https://openconnect.netflix.com/

84 Goel, V. and Somaiyamay (2015) Facebook Begins Testing Instant Articles From News Publishers. Available at: http://www.nytimes.com/2015/05/13/technology/facebook-media-venture-to-include-nbc-buzzfeed-and-new-york-times.html.

85 Shontell, A. (2014) Mary Meeker's Stunning 2014 Presentation On The State Of The Web. Slide 43. Available via: http://www.businessinsider.com/mary-meekers-2014-internet-presentation-2014-5?op=1&IR=T&IR=T.

86 For an account on the personalisation trend see for example: http://techtrends.accenture.com/us-en/internet-of-me.html. Viewed 2 November 2015.

they start typing[87]; however, it remains to be seen how this kind of algorithmic curation works out for smaller players, especially when these curators are also providing content or other services, like Netflix and Amazon with media content. Recently, Google was accused by the US FCC of manipulating its search engine results to promote its own services[88].

Highly personalised services will require and draw large amounts of personal data from users. This raises important privacy issues and questions about transparency and ownership of the data, but also provides opportunities for privacy enhancing technologies and new means for identity management such as 'data lockers'[89]. Twitter and Facebook already perform authentication services for other platforms. In 2014, Facebook presented its Anonymous Login, a feature which would enable users to use its authentication to try out new services without sharing information about themselves[90]. Advanced or ***hyper personalisation of services*** has been linked to polarisation and ghettoization of the Internet in several studies.[91, 92] Evidence points in both directions though.

A Wharton study on music recommendations indicates that receiving suggestions tailored to individual listeners actually widens exposure to new products and fosters human bonds. [93]

3.2.5. Consumption of content

The wide adoption of smartphones, tablets and new devices and technologies also reflects changes in consumption modes and patterns: 'on the go' and 'on demand'[94].

In Europe, mobile Internet, as a percentage of total Internet usage, has doubled from 8% in 2013 to 16% in 2014. The smartphone and tablets are becoming more important in the overall daily screen-time[95]. This provides opportunities for new entrants because more time is spent by users on screens that are not controlled by cable companies and telecommunications network operators.

---

87 As described in the Google support section on the websearch service pages. See https://support.google.com/websearch/answer/106230?hl=en. Viewed 2 November 2015.

88 Burton, G. (2015) Google manipulated its search engine to promote its own services and took content from rivals – report. Available via: http://www.computing.co.uk/ctg/news/2400950/google-manipulated-its-search-engine-to-promote-its-own-services-and-took-content-from-rivals-report.

89 See for example: Perez, S. (2015) Over-The-Top Streaming Video Services to Surge to 330 Million+ Subscribers by 2019. Available from http://techcrunch.com/2015/05/18/over-the-top-streaming-video-services-to-surge-to-330-million-subscribers-by-2019/. Viewed on 2 November 2015.

90 See the information on anonymous login on the Facebook developers pages. Available at https://developers.facebook.com/products/anonymous-login. Viewed 2 November 2015.

91 Bartlett, G., Miller, C. (2011) 'truth, lies and the internet, a report into young people's digital fluency'. , Demos. Available via https://www.nominettrust.org.uk/sites/default/files/Truth%20-%20web.pdf.

92 B Bosker, 'As Internet Use Grows, Is it Polarizing Political Views?', Huffington Post, 29 Mar 2011 www.huffingtonpost.com/2011/03/29/internet-polarizing-politics_n_842263.html.

93 Hosanagar, Kartik and Fleder, Daniel M. and Lee, Dokyun and Buja, Andreas, Will the Global Village Fracture into Tribes: Recommender Systems and Their Effects on Consumers (April 1, 2014). Management Science, Vol. 60, No. 4, pp. 805-823, April 2014. Available at SSRN: http://ssrn.com/abstract=1321962 or http://dx.doi.org/10.2139/ssrn.1321962.

94 See for instance: PWC (2015) Feeling the Effects of the Videoquake. Available via : https://www.pwc.com/en_US/us/industry/entertainment-media/publications/consumer-intelligence-series/assets/pwc-cis-videoquake-video-content-consumption.pdf

95 Shontell, A. (2014) Mary Meeker's Stunning 2014 Presentation On The State Of The Web. Slide 96. Available via: http://www.businessinsider.com/mary-meekers-2014-internet-presentation-2014-5?op=1&IR=T&IR=TT

In addition to trends in the consumption of content and services, users are adopting more active roles, for instance by distributing content on social media and by creating and sharing their own content, either searchable and permanent (e.g., on YouTube) or not-searchable (e.g., Facebook) and ephemeral (e.g., Snapchat), or live (e.g., Meercat and Periscope).

By creating and sharing content, but also by interacting with a service (e.g., entering a search query, selecting a song or pausing a movie), ***users are generating millions of data points that are collected and used by the service providers***, to improve the user experience and for advertisements.

There are an increasing number of privacy-enhancing technologies (for instance, homomorphic encryption[96]) and services (such as adblockers, which have over 20 million users on Firefox[97] and 10 million users on Chrome), or Ghostery (which enables users to know and control what websites keep track of them and what data they share)[98]. Furthermore, services like Snapchat provide ephemeral media sharing with over 100 million daily users[99].

In spite of these clear signs indicating an increased interest in privacy protection still only a small proportion of consumers is guided by privacy concerns in how they interact with digital services, which is described as the 'privacy paradox'[100].

Finding 19. Concerns over the 'privacy paradox' remain, but indications are mixed. On the one hand, even though consumers indicate that privacy protection is very important to them, only a small percentage permit this to guide their actions in terms of how they interact with digital services. On the other hand, the growing popularity of adblockers suggests that some consumers are willing and able to protect their own privacy.

3.3. New business models

Advertising is one of the fundamental pillars of many OTT business models, just as it is for traditional modes of media delivery, such as television and newspapers[101]. Considering the amount of time spent on media and advertising spending, print and television are over-indexed, while online (especially mobile) remains underspent[102]. This could lead to a correction in the coming years, which would mean that more revenues might become available to content and application services providers (CAPs)[103].

---

96 See the Wikipedia entry on Homomorphic encryption: https://en.wikipedia.org/wiki/Homomorphic_encryption. Viewed 2 November 2015.

97 From the adblocker Mozilla Firefox webpages. See https://addons.mozilla.org/En-us/firefox/addon/adblock-plus/. Viewed 2 November 2015.

98 More information on Ghostery on the product web pages. Available at https://www.ghostery.com/en/why-ghostery/for-individuals/

99 DMR (2015). Snapchat statistics. Available at http://expandedramblings.com/index.php/snapchat-statistics/. Viewed 2 November 2015.

100 See for instance: Roosendaal, A., Nieuwenhuis, O., Ooms, M., Bouman-Eijs, A. & Huijboom, N. (2015). Privacybeleving op het Internet in Nederland. Den Haag: TNO/Ministerie van Economische Zaken; and Friedewald, M., Lieshout van M., Rung S., Ooms, M. and Ypma, J. (2015) Privacy and Security Perceptions of European Citizens: A Test of the Trade-o_ Model. In: J. Camenisch et al. (Eds.): Privacy and Identity 2014, IFIP AICT 457, Chapter 4, 2015.

101 Zuckerman, E. (2014) The Internet's Original Sin. Available via: http://www.theatlantic.com/technology/archive/2014/08/advertising-is-the-internets-original-sin/376041/.

102 Shontell, A. (2014). Mary Meeker's Stunning 2014 Presentation On The State Of The Web. Slide 16. Available via: http://www.businessinsider.com/mary-meekers-2014-internet-presentation-2014-5?op=1&IR=T&IR=T.

103 PwC (2014), Global Entertainment and Media Outlook 2014-2018. See http://www.digitaltveurope.net/188792/ott-revenue-to-grow-by-28-1-per-year-says-pwc

Overall, revenues of OTT services are growing, and can be expected to continue to grow in the coming years[104]. Digital services such as Netflix and Spotify are using subscription models, while others follow the iTunes model – the unbundling of services with micro payments, such as the Dutch service Blendle for news articles[105]. Games often apply a combination of free or one-time purchase with the option of in-game additional purchases (e.g., levels, characters, and features)[106].

In addition to the regular modes of revenue generation, crowdfunding services such as Kickstarter provide companies and individuals a platform to find launching customers. This source of capital could potentially make them less dependent on seed capital from angel investors and VC funding (at least for the initial funding)[107], which would be especially relevant to start-ups and SMEs. In addition to generic crowdfunding platforms, there are also services that have a specific focus, for instance geographically, or for a specific industry, such as music, film and journalism.[108]

Access and control over data will be increasingly important, for instance to deliver personalized content and more effective advertisements. There are also examples of dynamic and even discriminatory pricing in which individuals are charged different prices depending on the device they use[109] [110].

Many start-ups are entering the field of data-driven services, not only in media and communication, but also in more physically entrenched sectors (e.g., Uber in mobility and Nest in energy)[111]. As data becomes an important asset, it leads to new data-centric business models[112] – for instance around the role of data intermediary and platform that acquires, cleans, integrates and sells access to data (e.g., services like Gnip, Factual and ESRI). *Furthermore, as both online and offline activities of users generate more and more data, this data can be monetized directly, but also indirectly by using the data in a different context*. The data that Google collects on users of Google Maps can be used for advertising purposes in Search and Gmail.

---

[104] Tyntec whitepaper on OTT services (2013). See http://www.tyntec.com/resources/whitepapers/ott-services-blow-up-the-mobile-universe.

[105] See for example: Adams, M. (2015) CES Wrap: Four OTT Trends for 2015 http://www.v-net.tv/ces-wrap-four-ott-trends-for-2015.

[106] Grub, J. (2014) Report finds free-to-play microtransactions make up 79% of U.S. app store revenues. Available via: http://venturebeat.com/2014/02/21/report-finds-free-to-play-microtransactions-make-up-79-of-u-s-app-store-revenues/.

[107] On-demand services have increasingly received funding in the last five years. See for instance: http://www.slideshare.net/CBInsights/on-demand-report-with-cb-insights-prereleasefinal.

[108] See for example https://crowdfundingpr.wordpress.com/2013/06/02/top-ranked-crowdfunding-sites-for-rewards-based-perks-based-and-donation-based-fundraising-campaigns/

[109] Mattiolo, D. (2012) On Orbitz, Mac Users Steered to Pricier Hotels. Available via: http://www.wsj.com/articles/SB10001424052702304458604577488822667325882.

[110] Russon, M. (2014) Mac and Android Users Charged More on Shopping Sites Than iPhone and Windows Users. Available via: http://www.ibtimes.co.uk/look-out-you-might-be-charged-more-if-you-shop-online-using-mac-android-device-1474431.

[111] According to information on data startups available via Angellist. See https://angel.co/big-data.

[112] Hartmann, M. (2015) Big Data for Big Business? A Taxonomy of Data-driven Business Models used by Start-up Firms. Available via: http://www.cambridgeservicealliance.org/uploads/downloadfiles/2014_March_Data%20Driven%20Business%20Models.pdf.

3.4. The value of data

Considering these factors together, ***access to and control over data can be expected to become important strategic assets to create and capture value***[113].

In every step of the value chain – from content and service creation to consumption – data and data analytics enable more efficient processes, more effective decision-making, more personalized user experiences, and more sustainable business models. ***As 'datafication' evolves and becomes more and more an integral part of the online services ecosystem, this could lead to restructuring effects as both incumbents and new entrants try to create and manage strategic control points***. This is already apparent in the relation between publishers and Apple in the Apple Kiosk app (formerly Newsstand). The data about users and the way they interact with the digital newspapers and magazines is collected by Apple, and only to a very limited extent available to the publishers[114].

The DSM acknowledges data as 'a catalyst for economic growth, innovation and digitisation across all economic sectors, particularly for SMEs (and start-ups) and for society as a whole'.[115] It proposes for 2016 a European 'Free flow of data' initiative that tackles restrictions on the free movement of data for reasons *other than the protection of personal data* within the EU and unjustified restrictions on the location of data for storage or processing purposes. Member State practices restricting the possibility of storage and processing of certain data (especially public sector data) outside their territory constitute a key bottleneck.

Finding 20. Access to and control over data can be expected to become important strategic assets to create and capture value.

[113] See for instance: Cukier, K. & Mayer-Schönberger, V. (2013). Big Data: a Revolution That Will Transform how we Live, Work, and Think. Boston: Houghton Mifflin Harcourt Publishing Company ; or Manyika, J., et al (2013). Open data: Unlocking innovation and performance with liquid information. McKinsey Global Institute. Available via: http://www.mckinsey.com/insights/business_technology/open_data_unlocking_innovation_and_performance_with_liquid_information.

[114] Schonfeld, E. (2011) Aplpe's Digital Newsstand Just Disrupted The Publishing Industry. Available via: https://techchunch.com/2011/02/15/apples-digital-newsstand-just-disrupted-the-publishing-industry.

[115] European Commission (2015), A Digital Single Market Strategy for Europe. SWD(2015) 100 final. Available at http://ec.europa.eu/priorities/digital-single-market/docs/dsm-communication_en.pdf.

4. Costs and Barriers for European OTT Services

KEY FINDINGS

- The startup ecosystem in Europe is creating many OTT startups and scale-ups.
- Scaling-up remains a challenge in Europe. OTT giants such as Google and Facebook are predominantly based in the US and Asia. European start-ups such as Skype or Spotify looked for incorporation abroad when scaling up
- European high growth small businesses ('scale-ups') are responsible for a high proportion of economic and employment growth. In the UK it was estimated that 1/3rd of economic growth and 2/3rd of job growth in 2014 came from scale-ups.
- Two persistent challenges facing startups scaling up are: (1) access to risk capital and (2) fragmented regulation in particular free flow of data.
- The European capital market does not cater well to the needs of potential scale-ups. Although new initiatives are being launched such as the Capital Union and EFSI, the timeline for implementation is a concern.
- With startups shifting to vertical markets and the Internet of Things (IoT), access to significant risk capital to finance IoT technologies becomes critical.
- An important obstacle for OTT Startups operating cross-border and globally remains the fragmentation of data protection policies across Europe.
- The ideas behind the DSM and the Capital Market Union are appreciated in the OTT Startup/SME community but confidence in an effective implementation (fast, limited administrative burden and with the desired impact also for startups) is low.

In this chapter, we investigate the challenges faced by European OTT providers, with a particular focus on SMEs.

- Section 4.1 discusses the meaning of startups and scale-ups, and Europe's progress in digital innovation compared with the US.
- Section 4.2 discusses the barriers and costs for OTTs of doing business in Europe.
- Section 4.3 summarises the main findings.

The startup ecosystem is Europe is growing rapidly. Seed funding is increasingly available across the main startup hubs; however, scaling up to become an actual business of significant size remains a challenge, more so in Europe than in the US (where the majority of large OTT and online companies reside).

Research conducted by Octopus and the Centre for Economics and Business showed the importance of 'high-growth small businesses' on the UK economy. It showed that "though these 'scale-up' businesses accounted for only 1% of the total UK business stock, they generated 36.2% of the UK's economic growth and 68% of total employment growth".[116]

[116] Octopus (2014), High Growth Small Business, The economic value of Britain's fastest growing smaller companies. Available at https://s3-eu-west-1.amazonaws.com/octopushgsb/Octopus-High-Growth-Small-Business-Report-2014.pdf. Viewed 2 November 2015.

Some important challenges facing startups are being addressed by the Startup Ecosystem itself, Commission initiatives (in particular StartupEurope), and Member State initiatives such as StartupDelta in the Netherlands.[117, 118] However, two persistent challenges preventing startups from scaling up still need to be addressed. They are (1) access to risk capital, and (2) fragmented rules and regulation. Both need urgent action at the European level.

4.1. On Startups and Scale-ups

The stock of OTT companies includes a large proportion of internet startups and scale-ups. OTT services Skype,[119] Youtube and Netflix and Spotify have become household names in recent years. Both Skype and Spotify are companies founded in Europe. Behind these large scale CAPs is a long list of OTT startups and up and coming scale-ups. Figure 2 in section one above lists some of the key players.

New startups arrive on the scene daily. As of October 2015, leading accelerator and startup community platform F6S lists over 4000 media Startups, 2000+ entertainment startups, 1200 gaming companies, and 300 telecommunication company founders. The number of European startups in media, gaming and communications is comparable to that in the US.[120] F6S is a global community of startups with 98% penetration in the US and EU startup accelerator market.[121]

4.1.1. What is a Startup?

As with OTTs, there is no single widely agreed definition of what constitutes a startup. Steve Blank proposed the following elegant and popular definition[122]: "A startup is an organization formed in search of a replicable and scalable business model."

This emphasis on growth through conquering new markets and disrupting existing ones is what distinguishes a startup from a traditional SME[123]. Formally an incorporated startup classifies as an SME. The notion startup commonly refers to the first stages of Internet based SMEs aiming for high growth and rapid international expansion.

Internet platforms are enabling a new generation of scalable business models. Using web technologies, APIs and cloud platforms, startups in the Internet era can develop as well as distribute and sell their products in a very short time frame. Many operate independently of physical locations, both in terms of building their businesses and of finding and serving clients.

Startups have become cheaper and easier to set-up, making them an attractive vehicle to start an entrepreneurial career. The availability of open source tools, cloud computing, and the rise of virtual office infrastructure has driven the cost of launching an Internet venture down from €4.4 million in 1997 to €530,000 in 2002, and to €34,000 in 2008.[124]

---

[117] An overview of StartupEurope initiatives is available at http://startupeuropeclub.eu/
[118] For more information on Startupdelta see www.startupdelta.org
[119] Skype was founded in Europe, and continues to be developed to a significant degree in Europe, but now belongs to US-based Microsoft.
[120] There are 4500 media, 1000 gaming and 200 telecoms US Startups listed on F6S.COM
[121] More information on F6S on the company website www.F6S.com/f6s and featured articles such as http://tech.eu/features/783/f6s-europe-us/.
[122] In fact he put it slightly differently, see http://steveblank.com/2010/01/25/whats-a-startup-first-principles/.
[123] For an in-depth discussion on Startup definitions see http://www.forbes.com/sites/natalierobehmed/2013/12/16/what-is-a-startup/. Viewed 2 November 2015.
[124] Lisbon Council, Wired for Growth and Innovation, Issue 12/2012.

Internet based startups learned to cope with the high risk of failure, a global, borderless playing field and often unproven technologies, platforms and distribution mechanisms. They grow and fail faster than other businesses, which translates into higher rewards, but also higher risks.

The European Ecosystem

Only twenty years ago, the majority of tech startups hailed from startup ecosystems like Silicon Valley. Today, technology entrepreneurship is a global phenomenon, with startup ecosystems similar emerging around the world.

The European Startup Ecosystem is growing fast with leading hubs like London, Berlin and Amsterdam competing with the best in the world. Available venture capital for Startups shows a healthy growth in the leading hubs. In Amsterdam, startups are attracting three times as much venture capital (VC) funding as was the case only a few years ago[125]. Much of this venture capital is coming from foreign investors that are starting to look towards Europe. London and Berlin are equally strong. Italy, Portugal, Spain and Greece all have one thing in common: a struggling economy and the need to find new sources of growth. Technology seems to be the focus of many initiatives in these countries. Southern hubs, however, are catching up quickly.[126] Overall, there is more VC funding available in Europe than ever before, *and* there are more successful exits than ever before[127].

Accelerators

The rise of the modern startup coincided with the emergence of a new type of Startup Support Programme: the *Accelerator*. A recent whitepaper by NUMA based on discussions with 150+ accelerator programmes, offers the following definition[128]: "Startup accelerators, or seed accelerators, are typically for-profit organisations that foster a physical environment that supports accelerated growth for startups."

Startup accelerator programmes experienced massive growth in the past decade. US based Ycombinator opened its doors in 2005 as the first Accelerator programme, followed closely in 2006 by Techstars.[129] Only 10 years later, we can count 3,000 accelerators worldwide, of which over 800 are in Europe, with a similar number in the US and the remainder in Asia and Latin America. F6S, the largest global startup community, recently passed the mark of one million registered startup founders. The number of accelerator programmes continues to grow very rapidly (see Figure 21).

[125] According to information available on the Dutch startup portal, StartupDelta.org (2015).

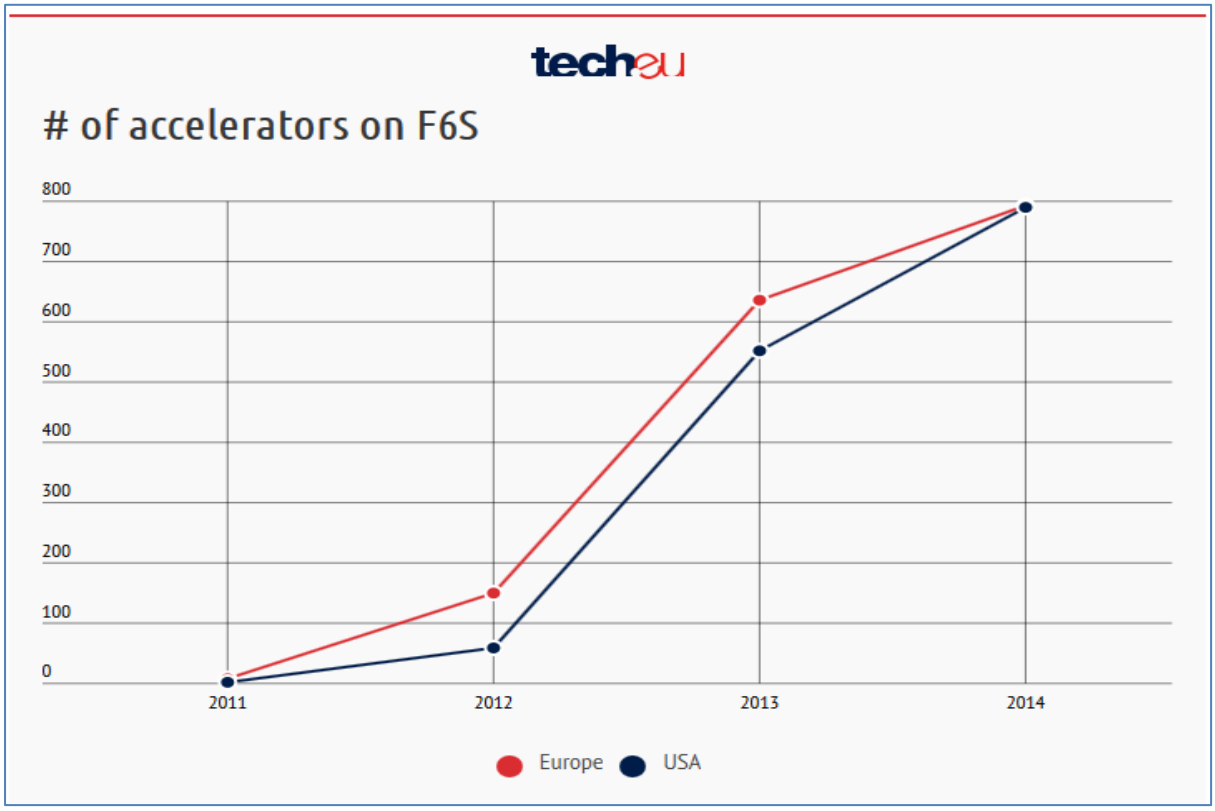
[126] Tech.eu (2015). 'Southern Europe's startup ecosystem is heating up'. Article post available on http://tech.eu/features/5149/southern-europe-startup-ecosystem-heating-up/. Viewed 2 November 2015.

[127] 5 Facts to better understand the European Startup Ecosystem (2015). Article posted on the StartupXplore community website. See http://startupxplore.com/blog/5-facts-better-understand-european-startup-ecosystem.

[128] Accelerate Now. Current trends and strategies for the future, NUMA, 2014. The article quotes an upcoming book *Accelerate, Founder Insights Into Accelerator Programs*, by Luke Deering, FG Press (2015).

[129] Information on Ycombinator via www.ycombinator.com. For more information on accelerators, see also http://en.wikipedia.org/wiki/Seed_accelerator

Figure 21. Accelerator programmes listed on F6S (2015)



Successful accelerator programmes such as Startupbootcamp, Rockstart, Seedcamp and Techstars attract up to 1000 applications per call from startup companies all over the world for a handful of places in their coveted programmes. A competitive selection process allows the accelerator programmes to pick only the best. Pairing excellent teams with intensive mentoring by experts in Technology, Marketing and Finance is the key to their success and popularity. Top accelerators achieve high survival rates considering the relative volatility of internet markets and the high attrition rates common among Internet Startup companies. There are widespread programmes across Europe, from prominent Bulgarian based ELEVEN to high powered Lisbon Accelerator BETA-I, from the massive Le Camping in France to the London based chapters of Techstars and Seedcamp. Pre-seed accelerator Startupweekend holds events in over 200 European cities[130].

The success of the startup accelerators is prompting more traditional business and academic incubators to adjust their programmes. As the reach of accelerator programmes expands we can expect a blurring of boundaries between these programmes in particular in the field of high tech and IoT[131]. A clear sign of this trend are the increasing number of big corporation-backed accelerators such as Wayra (Telefónica), hub:raum (Deutsche Telekom), Orange FAB (Orange), the ProSiebenSat.1 Accelerator, the Axel Springer Plug & Play Accelerator, Bonnier's Accelerator, BBC

[130] StartupWeekend.org is a global grassroots movement of active and empowered entrepreneurs learning the basics of founding startups and launching successful ventures. It holds events in over 100 countries and 580 cities around the world.

[131] From an article on corporate accelerators posted on Tech.Eu. See http://tech.eu/features/779/corporate-run-startup-accelerators-good-bad-plain-ugly. Viewed 2 November 2015.

Worldwide Labs, Mediafax's M.incubator, Pearson's Catalyst for Education and Yandex's Tolstoy Summer Camp."

4.1.2. Startups Expanding into New Markets

Internet guru Marc Andreessen has remarked that "Information Era startups have become a dominant source of economic growth, significantly automating and altering much of the industrial and service businesses of the previous economic era."[132]

Until a few years ago, many startups would be categorized as *web entrepreneurs*, active in the domain of Internet related services such as websites, communication tools, mobile apps, and other purely online services; however, with IoT software and hardware becoming affordable and accessible, the startup domain is expanding into numerous other domains (verticals). Wired, Forbes and TechCrunch suggest that "hardware is the new software". Advances in 3D-printing, programmable sensors and the availability of open source libraries of electronic modules enable more rapid prototype development of new products. Crowdfunding platforms like Kickstarter ease the process from design to actual production. Furthermore, the new layer of intelligence on these hardware products makes them upgradable over time, enabling fast iterations that were previously only possible for software products. In sectors entrenched in the physical domain, these interfaces for data collection and the presentation of output are important strategic assets that can act as platforms for additional services as the internet of things matures.

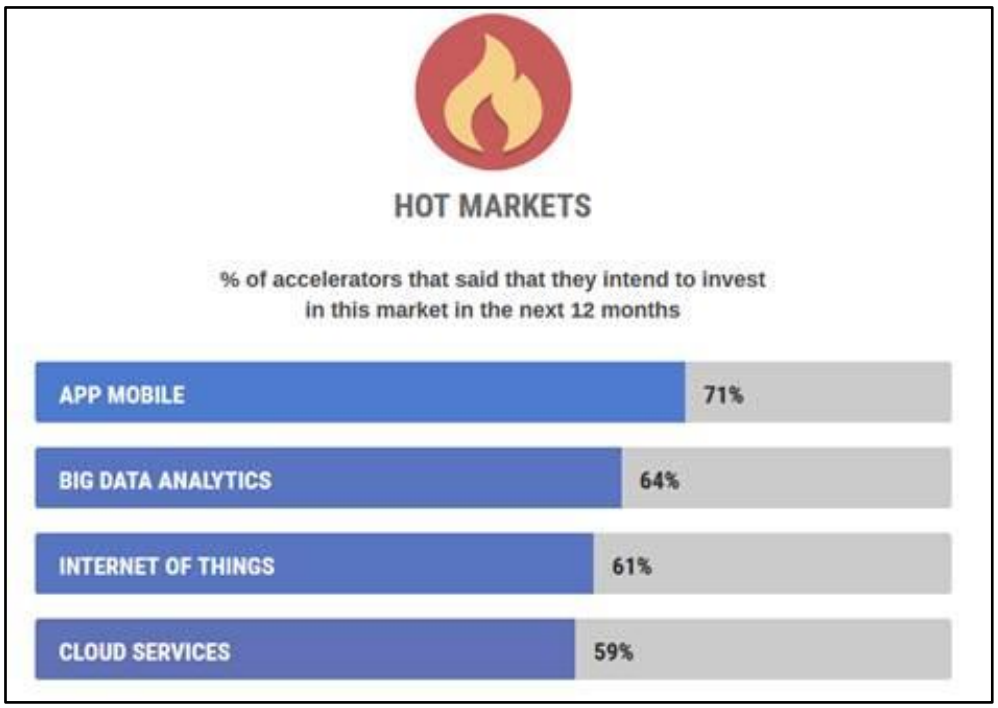
The *verticalisation* and the *shift to hardware* have prompted startup accelerators and VCs to expand into sectors such as energy, health, security, logistics and manufacturing. The rapid transformation of traditional industries and domains to advanced manufacturing businesses and industries that are becoming increasingly 'smart'[133], has led to a massive growth in accelerators and startups that focus on such domains.[134] Premier accelerator Startupbootcamp with programmes in 10 European cities, launched dedicated programmes on high tech (Eindhoven), smart materials (Limburg), smart cities and living (Amsterdam) and transportation and energy (Berlin). Leading Dutch accelerator Rockstart expanded their calls to domains such as smart health, smart energy, and even personalized food - all areas that have a close link with IoT technologies and applications.

Various IoT-centric programmes are popping up in Barcelona (Startupbootcamp), Berlin (Harware.co), Helsinki (Helsinki Ventures), Esbjerg, Denmark (Next Step Challenge), Sofia (11) and Munich (TechFounders). Programmes in the field of 3D printing and advanced manufacturing are also emerging, such as FABulous and GIGTANK. Vertical accelerators are bringing industry experts, networks and funds together to help startups grow.[135]

The rise of IoT and Big Data as investment areas for accelerators is illustrated by the markets in which accelerators plan to invest (see Figure 22).

[132] See Marc Andreessen's in his seminal Wall Street Journal essay, "Why Software is Eating the World".:
[133] For country-specific developments, see, e.g., http://www.smartindustry.nl/eng/ (NL), http://manufacturing.gov (U.S.) and http://www.plattform-i40.de/ (DE)
[134] Data from Fundacity, 2014
[135] Article on vertical incubators posted on hunterwalk (2013). See http://hunterwalk.com/2013/12/10/why-vertical-incubators-are-more-interesting-to-investors/.

Figure 22. Startups in IoT and Big Data



Source: Fundacity (2014). http://www.fundacity.com/european-accelerator-report-2014

An online search shows there are already 2,500 IoT and 8,000 Big Data & Analytics startups registered on F6S. About half of them are from Europe.

4.1.3. From start up to scale-up

A small group of rapidly expanding 'scale-up' companies drives a significant proportion of economic growth[136]. Research conducted by Octopus and the Centre for Economics and Business showed that ***while scale-up businesses accounted for only 1% of the total UK business stock, they generated 36.2% of the UK's economic growth and 68% of total employment growth last year***[137].

An accepted definition of scale-ups used by the OECD[138] and many other research agencies centers on sustained periods of fast growth: "Scale-ups are enterprises with average annualised growth in employees (or in turnover) greater than 20 per cent a year over a three-year period, having 10 or more employees at the beginning of the observation period."

Unfortunately, Europe lags behind the US and other leading economies in the number and size of scale-up companies. Research estimates that closing the scale-up gap in the UK alone could generate an additional 238,000 jobs and £38 billion additional turnover in the short term, £96 billion per annum in the medium-term, and a potential of £225 billion additional GVA in the long term (2034)[139].

[136] Coutu, S., (2014). The Scale-Up report on UK Economic growth. Available at http://www.scaleupreport.org/scaleup-report.pdf. Viewed 2 November 2015.
[137] Octopus (2014), High Growth Small Business, the economic value of Britain's fastest growing smaller companies, op. cit.
[138] OECD (2008). Manual on Business Demography Statistics: High-Growth Enterprises.
[139] According to research by RBS, NESTA and Deloitte referenced in the Scale-up report.

Scale-ups thus represent an enormous potential for Europe to boost growth and jobs in key innovation areas as IoT and Big Data. Given their inherently scalable internet business models, OTT companies are an important vector of this growth.

The next section will discuss the barriers and costs of high potential OTT Startups and SMEs in the EU.

4.2. Barriers for OTTs in the Single Market

4.2.1. Barriers and costs in the Single Market

A recent study by London Economics aimed to identify remaining barriers and costs experienced by businesses and suppliers in the Single Market and their adverse consequences.[140] It distinguishes two categories of key barriers:

- high-level barriers that are not sector specific but have pervasive effects on the economies of the member states and European integration; and
- specific barriers in two areas: digital markets and services.

High level restrictions include the cost of implementation of existing EU Directives, the national-level differences in product market regulation, and Public procurement. Table 2. Below from the London Economics report summarizes the key barriers and the potential impact of policy response.

Table 2. Key barriers to the Single Market and potential policy responses

Barrier	Approach	Benefits
Cross-cutting barriers		
Implementation of existing Directives	Expedite enforcement against member states for **undue delays** in transposing EU law Monitor **enforcement** of existing Directives by member states Monitor '**gold plating**' of existing Directives by member states	High (no quantification available)
Product market regulation	**Harmonisation** (to level of best-performing member states) The largest contribution to **closing the gap to the best performing member state** in terms of productivity would be in: real estate (14.9%)[1]	Cost of non-Europe in free movement of goods: 183bn per year[2)]

[140] Godel M. et al. (2015), Reducing Costs and Barriers for Businesses in the Single Market, study prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, Policy Department A.

Barrier	Approach	Benefits
Public procurement	**Extend the scope of Directives 2004/17 and 18** to cover network industries (water, energy, transport, telecommunications and postal services), financial services, broadcast media. Ensure universal use of **e-procurement** (to foster competition and alleviate administrative burden from procedures for the award of public contracts (public works, supply and service contracts) **Implement Directive 2009/81** (universal applicability of negotiated procedure with publication in defence procurement)	Potential GDP gains from closing gaps in the EU single market: e-procurement: €100bn per year[3)] Public procurement and concessions: €36bn per year[4)] Administrative burden of procurement procedures €216.3m per year[5)] Potential efficiency gains in through greater cooperation/ efficiency gains in the defence industry: €10bn per year[5)]
Digital Single Market		Potential GDP gains from completing the digital single market: €415bn per year[6)]
Digitisation gap	Create **European e-ID**/e-Trust framework	Size of enabled market €15-30bn per year; price efficiency related consumer surplus: €0.5–1.5bn[7)]
Consumer protection, trust & privacy	Consumer protection regulation Online dispute resolution	Consumer acquis: €58bn per year[8)] Online dispute resolution system: €22bn per year[9)]
Cloud computing	Create European technical and contractual **standards**; ensure compatibility with Data Protection Directive; Address remaining data-flow **restrictions**	Estimated direct Cost of Non-Europe in cloud computing €31.5bn per year[10)]
Telecoms	Abolish **roaming charges** regulate mobile **termination rates**	€5bn per year[11)] €2bn per year[12)]
Services		Untapped potential of free movement of services: €50bn per year

Source: London Economics (2015) [141]

For OTTs, alleviating cloud computing barriers is urgent. This will require an effective implementation of the Free Flow of Data Initiative proposed in the DSM communication. This is further discussed in 6.1.1. A detailed discussion on the barriers to free flow of data can be found in section 5.2.3. OTT services aimed at scaling across member states

[141] Godel M. et al. (2015), Reducing Costs and Barriers for Businesses in the Single Market, op. cit.

and internationally will benefit also from more expedient implementation of existing directives and harmonised product market regulation across member states.

The effective scaling of OTTs across Europe also requires addressing regional broadband bottlenecks[142]. This is hampering the consumer uptake of OTT video services delivered over the Internet. Access to exclusive content is a further impediment to OTT services roll-out in Europe[143].

4.2.2. Challenges to OTT startups and scale-ups

A 2013 study on the impact of impact of web entrepreneurs in the European Internet Economy found three main challenges facing Startups: (1) access to finance, (2) entrepreneurship culture, and (3) talent[144].

A comprehensive overview of challenges to startups in Europe can be found in the 'Startup Manifesto', an initiative by former Vice-President of the European Commission Neelie Kroes together with an independent group of founders in the field of tech entrepreneurship[145]. In addition to issues of finance, culture, and talent, it highlights the importance of data protection regulation.

From the previous section, it is clear that the startup ecosystem in Europe is improving rapidly, with several startup hubs across Europe such as London, Berlin and Amsterdam positively booming. Although some areas in Europe have a lot of catching up to do, the overall number of startups in Europe is starting to rival the number in the US, which is testimony to the potential of the European startup ecosystem.

When it comes to scale-ups, however, the story is different. The majority of high growth Internet companies in the world is still from the US and Asia. Two key barriers for scale-ups remain to be addressed: (1) *fragmentation of regulation* especially in the area of data protection and (1) *access to risk capital*.

4.2.3. Barriers to free flow of data

The 'Startup Manifesto', prepared in consultation with leading startup founders in Europe and signed by over 8000 stakeholders, claims that '*the lack of a unified data protection law in Europe erects unnecessary obstacles for companies wanting to transact with and across the region*'. As a whole, it considers Europe's laws more restrictive than the US, putting US companies and the US at an advantage. [146]

The manifesto calls for new uniform EU data protection law by all EU countries. Specific recommendations include the 'removal of the requirement for data providers to store information in any given country' and 'making government public'. In fact, there is no requirement to store the data in the same country in the DPD. However, transfer to third countries, that is non-EU countries, is bound to additional requirements. In the context of cloud computing, transfer to third countries will often be common, which may increase the burden for OTTs to offer their services.

---

[142] MTM London (2015). The Future of Subscription VOD in Europe. Paper available at http://go.ooyala.com/wf-mtm-vod.html, Viewed 2 November 2015.

[143] Ibid.

[144] TNO, Deloitte and IDATE (2013), 'Open platforms for web-based applications and services in Europe, enlarging the stakeholders community'.

[145] Help internet-driven economic growth transform the lives of millions. A manifesto for entrepreneurship & innovation to power growth in the EU (2013). Available at http://startupmanifesto.eu/files/manifesto.pdf. Viewed 2 November 2015.

[146] Ibid.

There are many possible cross-border data flow restrictions affecting companies (Table 3).

Table 3. Cross-border data flow restrictions

Types of Cross-Border Data Flow Restrictions	
Local Data Storage	Restricts data flows by requiring specified data — often but not always personal information — to be stored on local servers. May also require specific applications or services to operate in-country, processing data locally to avoid offshore transfer.
Data Protection	Restricts data flows through application of data privacy laws with adequacy and/or consent requirements that cannot reasonably be met without local data storage.
Geolocation Data Privacy	Restricts data flows by preventing the collection, disclosure, transfer or storage of geolocation data without an individual's consent.
Local Goods, Services or Content	Restricts data flows by requiring use of locally provided services or locally generated content. May also require use of domestically made or locally sourced equipment — limiting choice and perhaps efficiency but not data flows per se.
Government Procurement	Restricts data flows by limiting government procurement of foreign goods or services — for example, restricting information technology and communications contracts to locally delivered services.
Online Censorship	Restricts data flows by blocking or filtering information transferred into or out of a country.
Government Investment/Tax	Affects data flows by using tax incentives to promote use of local content (defined above) or labor.
Ownership/ Employment	Affects data flows by requiring in-country subsidiaries, branch offices or representation. May influence data flows by limiting foreign ownership or requiring joint ventures.
Local Production	Affects data flows by requiring local production of goods or services as a condition of market access — for example, requiring local data centers to deliver in-country services.
Payment Card Regulations	Affects payment data flows by requiring payment information to be stored locally.
Export Control	Affects data flows by requiring corporate intellectual property and other technology to reside in-country.
Forced Transfer of Intellectual Property	Affects data flows by requiring companies to transfer intellectual property to the countries in which they do business.
Traffic Routing	Affects data flows by requiring communications providers to route Internet traffic in a specific way.

Source: Business round table report 'Putting data to work' (2015)[147]

According to a report by the National Board of Trade in Sweden, two categories of barriers seem the most common and serious reported by companies: (1) *legal requirements to store data and locate data centres within a country's borders* and

[147] Business Roundtable (2014), Putting Data to Work. Paper available through http://businessroundtable.org/sites/default/files/reports/BRT%20PuttingDataToWork.pdf . Viewed 20 November 2015

(2) *regulations that restrict the ability to move and process personal data across borders*.[148]

The report lists countries imposing localization or local data storage requirements (Table 4). Within the EU, this concerns only Greece and France so far. Greece passed a law in 2011 that forms part of the country's implementation of the EU's Data Retention Directive. It states, in part, "Data generated and stored on physical media, which are located within the Greek territory, shall be retained within the Greek territory." Although the rule is critiqued, it remains in effect.[149] The EU is included because local storage requirements apply on the EU level. The starting point of EU data protection regulation is that personal data cannot be moved outside the EU, albeit with important exceptions.[150]

Table 4. Countries imposing localisation or data storage requirements

Types of ICT LBT	Selected Countries
Local IT infrastructure (such as data center) requirements	Brazil, China, Indonesia, Kazakhstan, Malaysia, Nigeria, Russia, South Korea, Ukraine, Venezuela and Vietnam
Local data storage requirements	Argentina, Australia, Brazil, Brunei, Canada, China, EU, France, Greece, India, Indonesia, Kazakhstan, Malaysia, New Zealand, South Korea, Taiwan, Turkey, Venezuela and Vietnam

Source: Kommerskollegium (2014)

More widespread and invasive than localisation and local data storage restrictions are *regulations controlling personal data*. These restrictions affect companies more often in their day-to-day operations[151]. Data protection laws can become overly burdensome or restrictive, and legal frameworks across countries differ resulting in increasing compliance costs and unpredictability. In spite of the unified Data Protection Directive, companies in the EU still have to deal with 28 different data protection rules because the Directive has been implemented differently across Member States. This causes uncertainty, administrative burdens, and costs when dealing with personal data in the EU[152]. Although the newly proposed General Data Protection Law addresses the issue of

[148] Kommerskollegium (2014). *No Transfer, No Trade – the Importance of Cross-Border Data Transfers for Companies Based in Sweden*. National Board of Trade, January 2014 – First Edition. ISBN: 978-91-86575-76-2. Available at http://www.kommers.se/Documents/dokumentarkiv/publikationer/2014/No_Transfer_No_Trade_webb.pdf.

[149] Business Roundtable (2012), Promoting Economic Growth through Smart Global Information Technology Policy, The Growing Threat of Local Data Server Requirements. Paper available at http://businessroundtable.org/sites/default/files/Global_IT_Policy_Paper_final.pdf . Viewed 2 November 2015.

[150] Exceptions are cases of consent, territories with adequate protection and Safe Harbour and like solutions.

[151] Kommerskollegium (2014), *No Transfer, No Trade,* op. cit.

[152] Costs to European firms of data-protection variation are an estimated €2.3 billion each year Commission (2012).

variation across member states, several far reaching provisions may significantly increase the administrative burden and cost of compliance. A study by Christensen et al. (2013) estimates the administrative costs created by the proposed regulation for EU SMEs in particular. It concludes that the average SME can expect its annual cost to increase by between approximately 3,000 and 7,200 euros, depending on the industry in which the SME is located. This in turn represents 16 and 40 per cent of current annual SME IT budgets. These estimates take into account the positive economic effects for SMEs (e.g. reduced costs for firms caused by only having to deal with one common EU Data Protection Agency)[153].

Finally, to complicate matters, existing EU/US Safe Harbour agreements have recently been declared void by the European Court of Justice (ECJ), complicating the exchange of data between the US and the EU[154]. This is likely to immediately and negatively impact European OTTs if their services are based on cloud applications or on US based platforms and are thus likely to imply the transfer of the personal data of EU citizens to the US or other third countries.[155] OTTs whose business is based on profiling for advertising and marketing might have to bear the cost of creating new and separate data processing centres in the US and the EU. This needs to be urgently addressed, but exactly how is not yet clear. We discuss this in Section 5.4.2.

4.2.4. Barriers to obtaining risk capital

The lack of risk capital for high technology innovation is an issue for startups, and an even more pronounced issue for "scale-ups", firms that are seeking to reach the next phase of growth.[156] Emerging and existing instruments have sought to address this,[157] but none of them are on point, as we explain shortly.

The aggregate size of the European economy roughly equals that of the United States, but Europe's equity markets are less than half the size of those in the US[158]. The total number of listed companies has been growing in Europe over the past decade, while it has declined in the US. In 2014, the number of listed companies increased in the US for the first time in over a decade.

Mid-sized companies receive five times as much funding from capital markets in the US as they do in the EU. European firms – especially those in countries on the periphery of Europe – have a difficult time attracting funding, as they depend on banks for around 80% of their external financing. Yet at the same time, there is no shortage of investable

[153] Christensen, L., A. Colciago, F. Etro and G. Rafert (2013), The Impact of the Data Protection Regulation in the E.U.

[154] Court of Justice of the European Union (2015), Judgment in Case C-362/14, Maximillian Schrems v Data Protection Commissioner. Press release No 117/15, Luxembourg. Available at http://curia.europa.eu/jcms/upload/docs/application/pdf/2015-10/cp150117en.pdf.

[155] There is no direct impact for other third countries yet, but it can be expected that other adequacy decisions may become invalid as well, for the same reasons as the Safe Harbor. This may impact, for instance, India, where a lot of outsourcing activities take place.

[156] See Karen E. Wilson (2015), How to unleash the financing of high growth firms in Europe, Bruegel, at http://bruegel.org/2015/05/how-to-unleash-the-financing-of-high-growth-firms-in-europe/. "Access to capital is critical for SMEs and start-ups. In particular, growth finance is important for young innovative firms, which are the drivers of growth and jobs in the economy."

[157] Among them are the SMEs aspect of H2020, the Capital Markets Union (CMU), and the European Fund for Strategic Investment (EFSI).

[158] European Commission (2015). Action Plan on Building a Capital Markets Union, 468 Final, SWD 183, 184 final. Available at http://ec.europa.eu/finance/capital-markets-union/docs/building-cmu-action-plan_en.pdf.

capital in Europe, and savers suffer from a lack of investment choices and dismal returns. The problem is that there is no unified European financing system[159].

Two new initiatives from the European Commission and the European Investment Bank (EIB) aim to address the functioning of capital markets in the EU: the Capital Markets Union (CMU)[160] and the European Fund for Strategic Investment (EFSI)[161].

The CMU aims to find new and innovative ways to channel funds efficiently from those enjoying surplus resources to those best able to make use of those funds. The CMU includes a comprehensive package of measures to support venture capital and risk capital financing in the EU. It includes amending existing venture capital legislation[162] and proposals for a range of pan-European venture capital funds-of-funds and multi-country funds supported by the EU budget in order to mobilise private capital. The measures will also include the promotion of best practices on tax incentives.

The EFSI aims to provide €21 billion in initial funding in order to mobilise private financing to the tune of €315 billion in additional investment in Europe to overcome the current investment gap in the European Union (EU).[163] The fund will focus its financing on investments in infrastructure and innovation, as well as finance for Small- and Medium- sized Enterprises (SMEs). This SME financing may be particularly relevant to startups and scale-ups. The fund will be set up within existing EIB Group structures, allowing it to start quickly and to benefit from the EIB's experience.

VCs interviewed on the challenges of OTT startups scaling up in Europe distinguish between two types of scaling-up strategies attracting different kinds of VC funds:

- The first type is 'scale to mass'. These companies initially do not focus on revenues, but on acquiring as many users as quickly as possible (preferably 100/200/300 million). These companies are typically companies that primarily focus on building a sound and scalable (and thus sustainable) technology. Getting the technology right is key to their success.
- The second type is more focused on "revenues from the start". Even though they use technology – for instance by providing an online service – they are less concerned with fast growth and technological development, and more geared towards generating revenues from the start towards the next cycle of investment rounds.

Attracting investment for the first type is much easier in the US than in Europe. Focusing on mass rather than revenue requires a type of funder that is scarce in Europe. In Europe, the majority of VCs is predominantly focused on companies that generate revenues in the short term. The challenge, however, is not getting started, but to take the next step to a second round of investments that is required to scale and become an company with significant size and impact. The VC funds willing to invest in this step (generally about one to two million EUR) are relatively scarce in Europe. US-based funds

---

[159] Danielsson, J.,, Micheler, E., Neugebauer, K., Uthemann, A., Zigrand, J., (2015), Europe's proposed capital markets union: Disruption will drive investment and innovation. Posted on Vox CEPR Policy portal. Available at http://www.voxeu.org/article/europe-s-proposed-capital-markets-union.

[160] European Commission (2015). Action Plan on Building a Capital Markets Union, op. cit.

[161] European Commission (2014). An investment plan for Europe. COM(2014) 903 final. Available at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0903&from=EN.

[162] In particular the European Venture Capital Funds (EuVECA) and the European Social Entrepreneurship Funds (EuSEF). For more information on EuVECA and EuSEF see http://www.esma.europa.eu/system/files/2014-311_qa_eusef-euveca.pdf

[163] For an overview of the EFSI investment plan see http://ec.europa.eu/priorities/jobs-growth-investment/plan/efsi/index_en.htm.

are less interested in revenue-generating, slow-growing companies, because they aim for a successful exit further down the line, in a third or fourth round of investment or even an Initial Public Offering (IPO), which demands enormous growth.

This makes it difficult for EU Tech Startups to focus on initial growth of the user base and the quality of their technology. On top of that, after the first period, these startups lack the user base that is required to entice international VCs for the second round of investments, because these VCs are more interested in scale, and compare European companies with US-based or Asian companies that can reach the required scale more easily.

More than skills and entrepreneurial culture, technology startups in Europe, including OTTs, need a well performing VC environment (in terms of culture, focus, instruments, and size) in order to scale up and to create jobs and growth. The next wave of innovation associated with the IoT is technology intensive. The high cost of labour, energy, fuel and infrastructure makes automation and optimization enabled by sensors and connectivity a smart investment for many businesses and smart industry in many European countries. Big companies such as Bosch and ARM have a new focus on the Internet of Things and connected devices, and they can potentially lead the way in establishing innovative IoT ecosystems attracting and facilitating startups and scale-ups; however, these next generation platform ecosystems will need significant access to capital.

There are many noteworthy differences between the US and the EU VC environments:

- American VC funds are interconnected and better aligned. US-based VC funds are more likely to engage other VC funds to join to get a first investment round off the ground. They are less interested in having a very big stake in a small selection of companies, but rather in having a smaller piece of the pie while hedging their bets to be sure that they are at least involved in one of the few winners. This also means that once a startup has a US-based VC on board, it is much easier to get funding from others as well.
- Senior partners of major VC funds often engage in the startup scene with personal seed capital, which means they connect the early developments with the rounds of bigger investments more easily, because this is interesting for them as well. US-based VCs are better informed and more in tune with technology and startups.
- US-based VC funds have long term vision, which makes them more flexible in terms of the freedom they provide to startups to change their plans when needed[164]. European VCs expect more detailed forecasts of activities and results, and expect the startups to follow them more strictly, regardless of new insights that might demand a pivot.

There needs to be more transparency in terms of available funding via various institutional actors and less reliance on funding via banks. This could be done by creating a central European VC funding strategy. With numerous small regional and local funds at present, no one is responsible. Fund managers should be well versed in technology and business, with ample experience in catering to the actual needs of startups.

The focus of the strategy should be on speed, ease of application, and short cycles of accepting or declining applications. It should incorporate the trajectory of scaling up

[164] Source of this information are interviews with European VCs investing in OTT, conducted in the context of the present study.

rapidly after the initial funding in a way that ensures the fund can capture RoI when a company becomes a success. It should base its strategy on the numbers game in which a very large number of startups will fail, but where some will be very successful. The proceeds from successful exits should be reinvested in new startups and new scaling trajectories.

The CMU aims to address some of these barriers that prevent startups from attracting capital in the expansion phase. For that reason, it is welcomed by most actors; however, many of the problems are deeply embedded in national legal and tax systems and European VC culture, and will therefore require time to make genuine progress. Time is scarce, however, in an industry that is already preparing for the next phase of disruptive innovation.

The landmark Aho Report[165] spoke of "the necessity for more positive European attitudes and culture towards entrepreneurship and risk taking." Fostering a willingness to accept calculated risks is beyond the reach of the Parliament, but creating institutions to moderate the financial impact of sensible risk-taking is not.

Creating greater consistency in bankruptcy rules across the Union might well be helpful.[166] One prominent expert, Karen Wilson of Bruegel, has remarked that "… progress needs to be made on addressing regulatory fragmentation across Europe in areas such as insolvency law and taxation. In many European countries, there is inadequate scope for companies to declare bankruptcy, which would allow them to restructure or more effectively close their businesses without lasting penalties that prevent future start-ups."

4.3. Findings and recommendations

A recent survey on the DSM action plan under Startups concluded that 'whilst there was general optimism that the principle of the DSM would be beneficial for business, this was coupled with widespread pessimism that execution of the DSM would entail additional bureaucracy or compliance costs for small firms, particularly if further efforts were not made to consult with startups and small businesses''.[167] This is a common theme. The ideas behind the DSM and the Capital Market Union are appreciated but confidence in an effective (fast, limited administrative burden and with the desired impact also for startups) is low. For example, the same survey under OTTs also highlights the importance of a unified VAT regime and complains that recently introduced VAT guidelines actually hurt startups.

Startups and scale-ups represent a large proportion of OTT and online services companies. While the European startup ecosystem is growing quickly in terms of the number of startups and facilities across regional hubs, scaling-up remains a challenge. Large OTT scale-ups are still predominantly based in the US and Asia.

European scale-ups are responsible for a high proportion of economic and employment growth in countries such as the UK. Two persistent challenges facing scale-ups are (1) *access to risk capital* and (2) *fragmented regulation*. The European capital market does not cater well to the needs of potential scale-ups. For OTT startups in Europe to successfully scale (and thus to create jobs and growth), the quality (culture, focus,

[165] Esko Aho et al. (2006), "Creating an Innovative Europe: Report of the Independent Expert Group", at http://ec.europa.eu/invest-in-research/action/2006_ahogroup_en.htm.
[166] See Karen E. Wilson (2015), op. cit.
[167] Based on conclusions of an online survey and workshop on the Digital Single Market (DSM) targeting startups. Article posted on Tech.EU Available at http://tech.eu/features/4248/digital-single-market-startups-europe.

instruments, size) of the VC market is paramount. Although new initiatives such as CMU and EFSI address this space, the time line for implementation is a concern.

With startups shifting to vertical markets and the Internet of Things (IoT), and thus presenting a key opportunity for European technology companies large and small, access to significant risk capital to finance IoT technologies (including IoT based OTT) becomes even more critical.

On the regulatory front, a key obstacle for OTT startups that operate cross-border and globally (or that would operate cross-border if they were not impeded by regulatory complexity) remains the fragmentation of data protection policies across Europe. A key concern for startups is the complexity and timeline of the proposed reforms. These issues are discussed further in Section 5.4.2. It will be necessary to address regulatory fragmentation, especially in regard to data protection, and to taxation. Simplifying the EU VAT regime and addressing the third country exemption would benefit European online firms (see Section 5.6). Regulatory fragmentation is an issue for all online service firms (see Chapter 5), but especially for OTT startups and scale-ups.

5. THE REGULATORY ENVIRONMENT FOR ONLINE AND OTT SERVICES

KEY FINDINGS

- The debate over OTT policy has traditionally focused on whether there is a 'level playing field' between OTT and traditional telecom operators; however, this question, while valid, is arguably not the most important aspect. Other key questions affecting Europe's digital industries are (1) do *regulatory variations within Europe* create challenges for online providers; and (2) *how does Europe's system compare with others worldwide* – in particular the US?
- Europe's rich cultural and linguistic diversity is a core strength and the digital single market creates an important opportunity to unlock new markets for European content, but the existing IPR regime has created artificial boundaries in the single market which hold back Europe's true potential.
- Variations in the rules within Europe create particular challenges for online providers in the field of data protection, security and legal interception. Although the planned GDPR may address some issues, the plethora of provisions, complexity, and burdens on service providers in this field remains of concern. Consumer protection and taxation are other fields where fragmentation is creating barriers to smaller online players.
- Areas in which Europe suffers internally from fragmentation and heavy-handed regulation on online services also put us at a disadvantage with international trading partners such as the US, which benefit in some cases from lighter and more consistent rules as well as linguistic cohesion. The US has an unambiguously more favourable regime for sales tax on online purchases compared with the EU. The US also has a generally light touch approach to privacy, although suffers from fragmented rules applying to specific sectors.
- We do not subscribe to the view that traditional telecommunication firms are being unfairly disadvantaged by the growth of online service providers (nor that the interconnection payment rules between them should be changed); however there are several areas in which traditional service providers face more stringent rules than online providers offering similar services, including consumer and data protection, and sectoral levies. Europe faces a key choice in this area – whether to scale up sectoral regulation, or to scale it back and rely more heavily on horizontal measures, coregulation and self-regulation.
- Now that measures addressing competitive tensions *between* network operators and OTTs have largely been settled (net neutrality provisions), the focus has shifted to *competitive concerns around the relationship between online platforms and their customers*. One concern is potential discrimination and unfair contract terms by dominant platforms. Competition law is applicable, but is notoriously slow. An alternative available in several Member States is legislation governing business contracts. Another key concern relates to switching and data portability.

This chapter (1) describes the regulatory and policy environment for relevant online services in Europe, and compares it with (2) European regulatory and policy measures imposed on providers of traditional telecom and broadcast services; and (3) corresponding regulatory measures imposed on their international counterparts (taking the United States as an especially relevant example).

Key questions thus include:

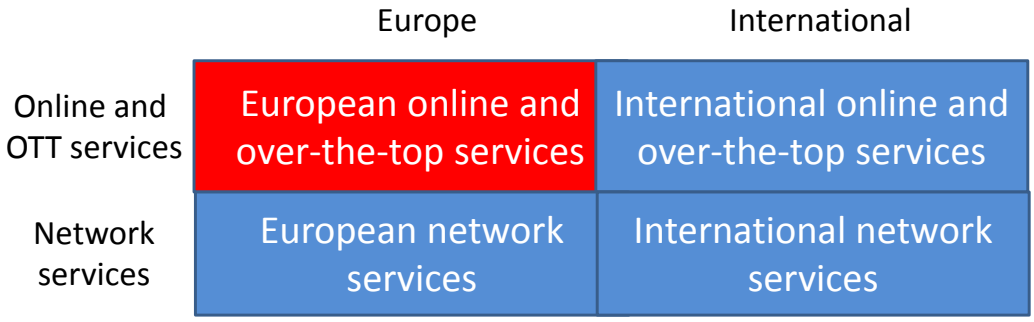
- To what extent might the regulatory and policy environment in Europe create barriers to doing business online in Europe for example as a result of fragmentation?
- To what extent might it disadvantage European content and application service providers in comparison with global online competitors?
- To what extent might it disadvantage European network operators in comparison with European providers of online or OTT services?
- To what extent might it disadvantage European network operators in comparison with global competitors?

Graphically, European regulatory and policy measures need to be compared both *horizontally* to corresponding measures in international comparator countries, and *vertically* to measures to which network operators are subject within Europe (see Figure 23).

Horizontal international comparisons of rules applicable to network operators are not specifically a concern of the current study (although they have been prominent in our previous work for the European Parliament);[168] however, the comparison of the *balance* between regulation of OTTs and that of network operators in Europe versus comparator countries is highly relevant. We can conceptualise this by breaking down the parties to which regulatory and policy measures might be applicable into sets: European versus international; and online or OTT services versus network services. *All four quadrants* of Figure 23 are relevant.

The concept of the level playing field has been used extensively to describe the relationship between traditional network operators and OTT. However, cast in this new light, we can see that there are other critical playing fields – within Europe and between Europe and other regions.

Figure 23. Parties to which relevant regulatory and policy measures could apply.



Source: WIK-Consult

As we noted earlier (see Section **Error! Reference source not found.**), the mere fact that an OTT service competes with a traditional electronic communications or broadcasting service does not necessarily mean that it is appropriate to apply the same obligations. Many factors would need to be considered on a case by case basis. To what extent are the services in fact equivalent? Does the OTT service in fact raise the same issues as those to which regulation of the corresponding traditional service seeks to

[168] See for example the WIK, TNO, RAND Europe 2013 study for the European Parliament "Entertainment X.0 to Boost Broadband Deployment"

respond? Given the implementation differences between traditional versus online services, to what degree is it proportionate or realistic to impose equivalent obligations? However, a core aspect of 'fairness' is that the same rules (and any exclusion concepts) should in principle apply to services which are substitutable. We touch on this issue extensively in this chapter, but as previously observed, we note that the 'level' treatment of OTT compared with traditional telecoms, may not be the primary concern preventing Europe from achieving its digital potential.

5.1. Common themes affecting regulatory policy

There are a number of issues which cut across debates on regulatory policy, and therefore require an upfront discussion. These include:

- The impact of *definitions* on regulation – this is especially relevant to the 'level playing field' debate
- *Jurisdictional issues* and the challenges and benefits of country of origin, country of destination and overarching EU solutions
- The potential to use *non-legislative solutions* (such as self or co-regulatory measures and standards) to address problems

We explore these in turn, before diving more deeply into the issues at hand.

5.1.1. What's in a definition?

From an end-user perspective, as seen in section 2.1, communications applications such as VoIP or online messaging can potentially substitute for telephony and SMS services offered by telecommunications operators. Video delivered via the Internet (such as Youtube and Netflix) can replace traditional content (linear television or on-demand programmes) provided over conventional networks or managed IP networks (such as those delivered via cable, IPTV, digital terrestrial, or satellite broadcasting). In general, there are trends towards an increase in online services and applications and a stabilisation or decline in traditional or managed services in those countries where online services have gained in popularity.

However, despite the fact that some online services may be used for similar purposes as corresponding and traditional or managed IP-based services, regulatory regimes are not necessarily aligned. This is in part because many (although not all) of the definitions used in legislation today relate to the means by which services are delivered (or how they are paid for) rather than the nature of the services themselves and how they are perceived by end-users.

For example, the definition which captures traditional managed voice - *Electronic Communications Services (ECS)* as defined in the European *Regulatory Framework for Electronic Communications (RFEC)* [169] is:

> *"a service normally provided for remuneration which consists wholly or mainly in the conveyance of signals on electronic communications networks"*

In turn being defined as an ECS or indeed an Audio Visual Media Service (AVMS) [170] provider entails certain rights and obligations associated with sector-specific legislation.

[169] Article 2 Directive 2002/21/EC as amended by Directive 2009/140/EC
[170] Article 1 Directive 2010/13/EU.

Online (unmanaged) services and applications are often not subject to sectoral rules, but generally fall within the definition of *Information Society Services (ISS)*[171] and are therefore subject to obligations outlined in the E-commerce Directive[172].

In addition, all digital service providers (both online and managed) are subject to *horizontal* legislation relating to consumer protection and data protection. For instance, the Consumer Rights Directive (CRD)[173] replaced, amongst others, the Distance Selling Directive and includes provisions on the conclusion of contracts by electronic means and the rights and guarantees that consumers have. The aim of the CRD is to strike a suitable balance between a high level of consumer protection and the competitiveness of enterprises. With regard to personal data protection, the Data Protection Directive (DPD)[174] is applicable and so will the forthcoming General Data Protection Regulation (GDPR) be at such time as it replaces the DPD.

A summary of the relevant EU definitions appears in Annex 1. A summary of the sectoral (telecommunications and media) obligations which stem from these definitions is shown in Annex 2, alongside general horizontal obligations which apply to all services.

Legislative rules are typically most prescriptive for providers of conventional electronic communications services (ECS) and AVMS, less prescriptive for information society services, and lightest or absent for online services which do not qualify as being an ISS.

Finding 21. Although some online services may be used for similar purposes as certain traditional or managed IP-based services, regulatory regimes are not necessarily aligned because some definitions are based on *how a service is delivered* rather than *how it is perceived* by the customer. The most prescriptive rules apply to providers of conventional electronic communications (ECS) and media services (AVMS). Less prescriptive rules apply for information society services (ISS). Horizontal consumer protection and data protection legislation applies to all services.

Although European definitions are not ideal, few positive lessons can be taken from the definitional approach pursued in the US. Regulation of electronic communications in the United States reflects a sharp dichotomy between two legal (not economic) classifications: *telecommunication services* and *information services*. Telecommunication services are subject to numerous regulatory obligations; information services were historically subject to few if any explicit obligations.

Core Internet services were always treated as information services, and thus largely unregulated; physical access to the Internet had, however, historically been treated as a regulated telecommunication service prior to the 2002-2005 period, when the US FCC (their NRA) classified Internet access when sold bundled with Internet service to be an information service, thus generally exempting it from regulation.[175] Most recently, the FCC's Open Internet Order of 2014 (which sought to address network neutrality concerns) restored the definitional *status quo ante*, but left bundled Internet access services largely unregulated in practice.

[171] Directive 98/34/EC.
[172] Directive 2000/31/EC on certain legal aspects of information society services.
[173] Directive 2011/83/EC.
[174] Directive 95/46/EC.
[175] See for instance J. Scott Marcus, 'Is the U.S. Dancing to a Different Drummer?', *Communications & Strategies*, no. 60, 4th quarter 2005. Available at: http://www.idate.fr/fic/revue_telech/132/CS60%20MARCUS.pdf.

5.1.2. Issues of jurisdiction

For any specific or horizontal rules which apply to online providers, a key challenge concerns the jurisdiction and enforceability of the rules. It is technically feasible to provide online services to European citizens and businesses cross-border within the EU or from outside the EU without the use of specific equipment hosted in or near the end-user. This capability inevitably raises questions as to which country's rules should govern.

There are challenges associated with all known answers to these questions. Applicability in the country of destination is preferable for consumers (and Governments in the case of taxation) and is an important tool in increasing trust; however, doing so implies that complying with rules can be onerous (especially for small online providers), and may deter cross-border provision of services. Problems of complexity might be reduced if the rules themselves were significantly harmonised; however, enforcement challenges might still remain, especially where the provider is based outside Europe.

Applicability in the country of origin[176] may improve the prospects of enforcement (at least for EU-based online providers); however, there may be challenges for end-users if rules significantly diverge, potentially undermining trust in online services.

In general, it is likely that large global online providers will be better placed than European start-ups to navigate complex rules which are differentiated per country.

Within the European Union, all things considered, the most ideal solution would be a fully harmonised regime (such as may be achieved through a Regulation), potentially also involving co-ordination by an EU body. Where this is not possible, consistently assigning jurisdiction and enforcement to the country of origin is likely to be simplest from the perspective of online providers.

Finding 22. It is technically feasible to provide online services to European citizens and businesses cross-border within the EU or from outside the EU. This capability inevitably raises vexing questions as to which country's rules should govern. No perfect solution is known, absent full harmonisation. Within the EU, in cases where direct harmonisation is not possible, consistently assigning jurisdiction and enforcement to the country of origin is likely to be simplest from the perspective of online providers.

5.1.3. The role of self-regulation and coregulation

Legislators are conditioned to consider legislative options to address problems they identify. An alternative however is to do nothing, i.e. relying on self- and co-regulation, potentially supported by standards. The *do nothing* alternative should always be considered – in particular because applying additional legislation to digital services may increase the overall burden of regulation compared with the status quo, with the risk of choking innovation by small firms including European online and OTT entrants. However, EU-level legal harmonisation remains the only effective way of abolishing differences between the legal systems of the individual Member States by replacing them with a uniform set of rules, binding on all Member States and all commercial operators (thus also avoiding free rider problems).

In general, there is a greater tendency in the online environment for codes of conduct and voluntary practices (co-regulation and self-regulation) than in the traditional sectoral

[176] The country of origin principle was originally developed by the European Court of Justice to give effect to the free movement of goods in 1978. Subsequently, it has been followed in a legislation applying to online services in Europe including the e-commerce Directive.

environment, where legislative or regulatory requirements are more likely to be a primary instrument. This approach mirrors the voluntary (unregulated) nature of the interactions which govern the Internet in general. One reason might be that the transnational character of the Internet calls for international rather than regional rules[177].

The European Commission's *Better Regulation Agenda*[178] adopted on the 19 May 2015 suggests that the Commission has recognised such trends. Concrete actions include the setting up of so-called *Communities of Practice (CoP)* for better Self- and Co-regulation. Examples of self- and co-regulation initiatives supported by the European Commission, specifically DG Connect, include Better Internet for kids, the European Cloud Computing Strategy, and the Online Behavioural Advertising initiative. Some illustrative examples are provided in Annex 2.

Finding 23. Although legislative solutions are prevalent for traditional industries, self and co-regulatory measures are more typically seen in the online environment. These may be justified in part by the need to find international rather than just European solutions to online problems.

5.2. Competition enforcement (including network neutrality)

Many claims and counterclaims have been made about the impact of online services on competition.

In this section, we firstly address the perceived competitive threat to OTT services from traditional managed service providers and the measures introduced to address these concerns. This issue has come to be known as *network neutrality*. We also summarise the counter-concerns raised by telecom network operators about the market power wielded by major online content and service providers in relation to interconnection agreements for the delivery of content.

Finally, we discuss two issues affecting competition amongst online service providers: (1) the alleged discrimination by major online platforms against customers (often SMEs), and (2) challenges with lock-in and switching provider.

In each case, it is relevant to ask not only whether the problem is genuine and significant, but whether existing tools can address these or similar issues.

5.2.1. Network neutrality

Network neutrality has been the subject of legislative initiatives not only in Europe, but also in the United States and in Brazil over the past year. The focus of these debates has centred on providing guarantees that consumers can freely access services and content of their choice via the public Internet. The underlying competitive concern, exhibited for example in the Netherlands[179], has been that if legislators did not step in to define the concept of network neutrality, fixed and mobile telecom operators which provide the broadband connectivity over which online services are provided, might have both the

[177] Cafaggi, Fabrizio et al (2014). Comparative Report, A comparative analysis of transnational private regulation: legitimacy, quality, effectiveness and enforcement. Scuola Nazionale dell' Amministrazione, Rome, Italy /EUI, June 2014, p. 40.

[178] http://ec.europa.eu/smart-regulation/better_regulation/documents/com_2015_215_en.pdf.

[179] In 2011, KPN and later Vodafone blocked mobile access to VoIP and messaging services on basic packages, requiring additional payments for an unrestricted service, The developments, which later led to one of the world's first net neutrality laws were widely reported e.g. at http://arstechnica.com/tech-policy/2012/05/netherlands-becomes-worlds-second-net-neutrality-country/

incentive and the ability to throttle or block online services which posed a commercial threat to their own tied services, such as messaging or VoIP.

a. The European Union

On 27 October 2015, the European Parliament formally approved the *Telecoms Single Market (TSM)* legislative package, which aims to address network neutrality concerns (and also roaming).[180, 181] Thanks to the Parliament's vote of 27 October 2015, the TSM will come into force. The final text is not yet available; however, versions that the Council has made public (on July 8, for example)[182] are presumably close to the final text.

The text that is available appears to represent a quite reasonable attempt to reconcile challenging and to some extent conflicting objectives. It provides approaches that appear sensible and pragmatic to:

- protect consumers from the most likely abuses;
- permit network operators to offer services with better than best-efforts Quality of Service, and enable consumers who want such services to obtain them;
- guard against any "crowding out" of the best-efforts Internet by prioritised, higher priced services (the so-called "dirt road" effect);[183]
- mitigate the risk of a proliferation of inconsistent or mutual incompatible network neutrality rules at Member State level.

Given that we assessed this subject matter for the Parliament less than a year ago,[184] we need not say more here.

Our judgment is that the new rules need to be given a chance to prove their worth.

b. The United States and other trading partners

In the United States, the FCC (the US NRA) recently implemented an Open Internet Report and Order, thus putting firm rules in place for network neutrality. These rules just came into force on 12 June 2015, after the US Court of Appeals for the District of Columbia Circuit refused a suit where various network operators and cable companies asked them to suspend implementation.[185]

---

[180] For the Commission's initial 11 September 2013 proposal, see European Commission (2013), Proposal for a regulation of the European Parliament and the Council laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, and amending Directives 2002/20/EC, 2002/21/EC and 2002/22/EC and Regulations (EC) No 1211/2009 and (EU) No 531/2012, 11 September 2013, COM(2013) 627 final.

[181] European Parliament (2015), End in sight for mobile phone "roaming" fees and unequal internet access, at http://www.europarl.europa.eu/news/en/news-room/content/20151022IPR98802/html/End-in-sight-for-mobile-phone-%E2%80%9Croaming%E2%80%9D-fees-and-unequal-internet-access.

[182] See draft amended TSM issued by the European Council at http://www.consilium.europa.eu/en/press/press-releases/2015/07/08-roaming-charges/.

[183] The likelihood that significant crowding out would eventuate, however, provided that last mile access remains effectively competitive (after taking access remedies into account), is probably low in our judgment.

[184] J. Scott Marcus (2014), "Network Neutrality Revisited: Challenges and Responses in the EU and in the US", IP/A/IMCO/2014-02, PE 518.751, available at: http://www.europarl.europa.eu/RegData/etudes/STUD/2014/518751/IPOL_STU%282014%29518751_EN.pdf.

[185] See Jon Brodkin (2015), "Broadband industry loses bid to stop Title II net neutrality rules", in *Ars Technica*, 11 June 2015, at http://arstechnica.com/tech-policy/2015/06/broadband-industry-loses-bid-to-stop-title-ii-net-neutrality-rules/; and United States Telecom Association versus Federal Communications Commission and United States of America, 11 June 2015, at

The new US rules are similar to those in Europe in some respects, but different in others. Notably, the new US rules place a strong prohibition on paid prioritisation. To an economist, the rationale for such a broad prohibition is difficult to understand, inasmuch as quality differentiation can under most circumstances benefit both producers and consumers of a service.[186]

In Brazil, a law was enacted in 2014 (the *Marco Civil*)[187] to deal with consumer and commercial privacy, lawful intercept (for law enforcement), network neutrality, freedom of speech on the Internet, e-government services, and more. The Brazilian government, together with CGI.br, recently concluded a public consultation that is intended to assist the ministry in crafting detailed rules and clarifications in regard to the provisions of the *Marco Civil*. Implementation details are clearly important: "The devil is in the detail."

Under the Marco Civil, the "The party responsible for the transmission, switching or routing has the duty to process, on an isonomic basis, any data packages, regardless of content, origin and destination, service, terminal or application." Exceptions are envisioned in light of technical requirements "essential to provision of services and applications", or to the prioritised delivery of emergency services.

In Japan, there has been a long-standing discussion about network neutrality,[188] but until recently the ministry (the MIC) has not felt that it was necessary to impose specific rules.[189] The state of competition was felt to be adequate to ensure a sufficiently neutral network. As the competitive landscape shifts (as noted earlier in this section), some trade groups and academic experts are calling for firm rules.

The intensity of the debate concerning net neutrality in the US compared with that in the EU reflects differences in the underlying competitive models for broadband access, especially in fixed markets. While access regulation has (in combination with cable and other infrastructure-based access) led to fiercely competitive broadband markets in the EU, deregulatory policies in the US have resulted in competition that is typically limited to at most two infrastructures (telecommunications and cable) in most of the US. The lack of effective broadband competition in the US raises the risk of potential abuses by network operators against OTT providers, since consumers have little ability to simply 'jump ship'. This does not mean, however, that there is no such risk in Europe. In particular, European mobile markets, which are typically characterised by fewer stronger players than fixed broadband markets, have experienced instances of restrictions on VoIP services. BEREC reported worrisome practices affecting mobile in the context of a 2012 Report on competition issues in the scope of network neutrality.[190]

https://s3.amazonaws.com/s3.documentcloud.org/documents/2096865/net-neutrality-stay-denied.pdf.

[186] Cf. J. Scott Marcus (2014), "Network Neutrality Revisited: Challenges and Responses in the EU and in the US", op. cit.; Harold Hotelling (1929): Stability in Competition, *The Economic Journal*, March 1929, pages 41-57.

[187] An unofficial translation into English is available at: https://www.publicknowledge.org/documents/marco-civil-english-version.

[188] See for instance Kenneth R. Carter, Tomoaki Watanabe, Adam Peake, J. Scott Marcus (2010), "A Comparison of Network Neutrality Approaches In: The U.S., Japan, and the European Union".

[189] Toshiya Jitsuzumi (2015), "Recent Development of Net Neutrality Conditions in Japan Impact of Fiber Wholesale and Long-term Evolution (LTE)", op. cit.

[190] BEREC Report on differentiation practices and related competition issues in the scope of net neutrality http://www.berec.europa.eu/eng/document_register/subject_matter/berec/reports/1094-berec-report-on-differentiation-practices-and-related-competition-issues-in-the-scope-of-net-neutrality

Finding 24. The EU net neutrality provisions in the Telecoms Single Market (TSM) Regulation appear (based on the currently available text) to represent a reasonable attempt to reconcile challenging and to some extent conflicting objectives. On the other hand there is a risk that the US rules – especially as regards the prohibition on paid prioritisation – may have gone a step too far.

5.2.2. IP interconnection

There are multiple dimensions of the IP interconnection challenge.

a. … between network operators and online service providers (connecting customers to content)

While consumers and NRAs have raised concerns over network operators' potential to act as gatekeepers to online services, network operators have highlighted an opposing concern about potential market power of major online service providers as gatekeepers to attractive content. Specifically, they have claimed that by generating demand for bandwidth, online service providers have generated expenses in (next generation) infrastructure investment, but have not made a fair contribution to these expenses through the 'interconnection' arrangements they make with telecom operators.

A 2010 paper by AT Kearney[191], for example, suggested the introduction of a 'reasonable traffic conveyance charge' at the wholesale level, implying that commercially agreed rates were not reasonable. Various studies have rebutted these claims, highlighting the investments by online service providers in their own content delivery infrastructure, as well as the commercial negotiation process involved in peering and transit.[192] Ultimately, proposals put forward to the ITU in 2012 by the EU telecom trade organisation ETNO for a new interconnection model which aimed to secure greater contributions from online providers[193] failed to secure backing.[194]

However, although IP interconnection is still largely unregulated in developed countries, debates about appropriate *wholesale IP interconnection* charging models between network operators and online service providers persist.

European NRAs have always had the theoretical ability to use Article 5 of the Access and Interconnection Directive to intervene in interconnection disputes (e.g. peering disputes), but Article 5 has to the best of our knowledge never been invoked as such. NRAs have however implicitly invoked its authority on occasion to justify intervening in order to mediate disputes.

This *laissez faire* attitude appears to be changing over time. In recent years, a number of interconnection disputes have received prominent coverage in the press. European NRAs have become increasingly concerned, which has for instance led the French NRA ARCEP to collect data on IP-based interconnection (so-called *peering* arrangements).[195]

---

[191] AT Kearney: A viable future model for the Internet (2010), at https://www.atkearney.com/documents/10192/4b98dac5-0c99-4439-9292-72bfcd7a6dd1.

[192] See for example J Scott Marcus (2011) Network Operators and Content Providers: who bears the cost?, at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1926768.

[193] See ETNO/ITRs Proposal to address a new internet ecosystem, at https://www.etno.eu/datas/itu-matters/etno-ip-interconnection.pdf.

[194] See for example the comments from BEREC at http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_120_BEREC_on_ITR.pdf.

[195] See for example ARCEP's administrative inquiry on the technical and financial terms governing IP traffic routing

In the generally *laissez-faire* United States, the FCC (the US NRA) has in its Open Internet Report and Order[196] asserted authority to make case by case judgments in regard to IP-based interconnection. Just a few years ago, it would have been nearly unthinkable for the FCC to take such a strong stand on IP-based interconnection.

Finding 25. Some European telecoms operators have claimed that online service providers can exert market power to secure interconnection deals that do not properly compensate investments in fibre infrastructure. We have not so far found compelling evidence that this is the case. IP data interconnection (for peering and transit) remain largely unregulated. However NRAs in the EU and US have begun to show a greater interest in this area and willingness to use existing powers to resolve disputes.

b. … between communications providers (ensuring interconnection and interoperability)

The regulatory treatment of traditional voice services using national numbering plans so as to ensure interconnection and interoperability differs considerably from that of online voice services.

The termination (completion) of voice calls to fixed or mobile networks is highly regulated in nearly all developed countries as a result of perceived network operator market power over the telephone number.[197] This regulation is often (but not always) applied regardless of technology, and thus also covers VoIP telephony to the extent that it makes use of national numbering plans.

There are, however, no obligations for communications applications running on the Internet such as VoIP and messaging applications to be interoperable, and in practice most online-only applications are not.[198] This does not necessarily raise problems for consumers, however, due to the ease by which customers can subscribe to multiple communications applications simultaneously (known as *multi-homing*), rather than having a single subscription as is common for managed fixed and mobile telephone services.[199] The fact that the majority of customers also have a fixed or mobile managed service further mitigates concerns over interoperability; however, this lack of interoperability may create challenges for entrants in the online communications space if they are too small to benefit from network effects. If online communications were to substantially replace conventional voice calls over time, this might either increase or decrease interoperability concerns.

Even if a lack of interoperability becomes a concern, it is worth recalling that legislation and regulatory obligations are only one route to interoperability. Voluntary standards could also provide solutions. The Internet is by design an interoperable system[200] and

http://www.arcep.fr/index.php?id=8571&L=1&tx_gsactualite_pi1%5Buid%5D=1619&tx_gsactualite_pi1%5BbackID%5D=26&cHash=f093b768af47c0c5129d03e0800a0e7d.

[196] FCC 2015 Open Internet Order at https://www.fcc.gov/document/fcc-releases-open-internet-order.

[197] For example, within the EU, fixed and mobile termination are defined within the European Commission 2014 Recommendation on Relevant Markets in the electronic communications sector as markets for wholesale call termination on *individual* telephone or mobile networks http://ec.europa.eu/newsroom/dae/document.cfm?action=display&doc_id=7118

[198] For example, free Skype calls are designed to be used within a closed user group.

[199] Requirements in 2001 by the FCC for AOL to offer instant messaging interoperability as a condition for the merger with Time Warner https://transition.fcc.gov/transaction/aol-tw/instantmessaging.html did not apparently result in significant usage of the interoperability conditions. Relief was granted on this condition in 2003

[200] For example – a definition given by dictionary.com describes the Internet as a "vast computer network linking smaller computer networks worldwide. The Internet includes commercial,

associated services such as email are also interoperable; however, this interoperability is not legislated. Interoperability came about through voluntary adherence to standards (including Internet Protocol[201] and the related protocol suite).

Whether technical standardisation alone would suffice is not altogether clear today. Economic theory suggests that incentives to interconnect are similar to those for standards compliance, and pose potential challenges. Small firms will be motivated to interconnect and to interoperate, but a firm that is sufficiently large (both in absolute terms, and in comparison to its next largest competitor) will tend not to be motivated to interconnect or to interoperate.[202]

Finding 26. Interoperability, interconnection, and termination of calls to telephone numbers is highly regulated, while interoperability of online messaging and VoIP applications is not. This is not necessarily a problem, inasmuch as users can subscribe to multiple services; however, if online communications substantially replaced traditional communications, lack of interoperability with large networks might raise barriers to entrants in this field. Although they have not been used, NRAs appear to have the tools to address these problems if and when they occur.

5.2.3. Competition concerns raised by dominant platforms

Alongside debates concerning the relative positioning of network operators and competing online service providers, significant attention has been given in recent years to the potential competitive impact of the growing strength of major online platforms on companies (including SMEs) which depend on them.[203]

Unlike telecommunications markets which may give rise to bottlenecks as a result of scale economies and barriers to entry[204], online services exist in an environment which is in principle highly contestable; however, certain services may also be characterised by strong network effects.[205]

Network effects occur in cases where users are increasingly drawn to platforms which have the most users. Examples are:

- Social networking sites. The presence of existing contacts on a given social networking platform is likely to encourage others to join.
- Voice and messaging. If messaging services are not interoperable, there are benefits from joining those which have the most reachable contacts. This is one

educational, governmental, and other networks, all of which use the same set of communications protocols."

[201] Wikipedia describes Internet protocol as "the principal communications protocol in the Internet protocol suite for relaying datagrams across network boundaries. Its routing function enables internetworking, and essentially establishes the Internet."

[202] Katz, Michael L./ Shapiro, Carl (1985): Network Externalities, Competition, and Compatibility, in *The American Economic Review*, Vol. 75, pp. 424-440. Farrell, Joseph / Saloner, Garth (1985): Standardization, Compatibility, and Innovation, in the *RAND Journal of Economics*, Vol. 16, pp. 70-83; and Crèmer/Rey/Tirole (2000) Crémer, Jacques/ Rey, Patrick/ Tirole, Jean (2000) : Connectivity in the Commercial Internet, in *Journal of Industrial Economics*, Vol. 48, pp. 433-472.

[203] These effects, together with factors that mitigate concerns, were a major topic of discussion at a European Parliament workshop in January 2015. See European Parliament (2015), "Cross-Competition among Information (Digital) Platforms: Proceedings of the Workshop".

[204] For example, relating to spectrum allocation.

[205] See for example discussion in the EP (2015) study "Challenges for Competition Policy in a Digitalised Economy", at: http://www.arcep.fr/index.php?id=8571&L=1&tx_gsactualite_pi1%5Buid%5D=1619&tx_gsactualite_pi1%5BbackID%5D=26&cHash=f093b768af47c0c5129d03e0800a0e7d.

example which is relevant to both telecommunications and equivalent OTT services.

- E-commerce platforms – a wide availability and choice of products and services is likely to attract those seeking to purchase services.

In turn, popular services and platforms are likely to generate advantages in their business-to-business relationships – attracting increased advertising revenue, 'tenants' (in the case of online shopping malls), and content providers (such as music or film), which further supports the financial viability of the largest players. Data gathered in the context of one online activity could also be used for advantage in other activities such as through the targeting of offers or advertising.

This may lead to online platform providers in specific segments becoming dominant, with potential consequences for competition. It is important to note that dominance is not necessarily a problem in and of itself; rather, action is taken under competition law only if dominant online service providers abuse their dominance to the ultimate detriment of consumers[206] or breach other rules concerning fair conduct.

Several investigations have been opened that concern potential discrimination by dominant online providers in favour of their own services, practices which aim to leverage dominance from one platform into another, or other unfair contractual conditions which impact businesses relying on these platforms to reach a wider audience. For example:

- In April 2015 the European Commission (DG Competition) sent a statement of objections to Google around concerns that it favours its tied shopping service. It is also continuing to investigate concerns over the way Google presents material from other websites, as well as its use of contractual conditions which may affect advertisers' ability to promote or switch to other services[207].
- The Commission's investigation of the Android operating system (used in many mobile devices) looks into whether Google may be exploiting its position in operating systems by negotiating agreements which disadvantage rival applications and services[208].
- Amazon UK was subject to investigations by the UK Office of Fair Trading and Germany's Federal Cartel Office concerning its use of contractual terms which aimed to prevent publishers from selling at a discount through their own sites. It agreed to end this practice in August 2013[209].

The types of concerns raised over dominant online platforms such as Google were described in a speech by the former Competition Commission Joaquin Almunia in June 2014[210]. Commissioner Almunia noted in this context that while he considered that some fell under the remit of general competition law, others were separate issues that should be discussed for example in the context of data protection and net neutrality legislation.

---

[206] DG Competition guidelines concerning abusive conduct: http://ec.europa.eu/competition/antitrust/art82/

[207] EC April 2015 Statement of objections to Google http://europa.eu/rapid/press-release_IP-15-4780_en.htm

[208] DG Comp memo Android investigation http://europa.eu/rapid/press-release_MEMO-15-4782_en.htm

[209] http://www.out-law.com/en/articles/2013/august/oft-minded-to-close-amazon-probe-after-company-drops-price-parity-policy-in-the-eu/.

[210] Public policies in digital markets. Speech Almunia June 2014 http://europa.eu/rapid/press-release_SPEECH-14-515_en.htm.

It is notable that while concerns about discrimination and unfair contract terms may only be addressed at EU level by means of competition law provisions concerning 'abuse of a dominant position' under the EU Treaty, several Member States have national laws which enable authorities to intervene against business contractual terms that are deemed to be unfair.

Such provisions were for example used in a case brought by the French Government concerning contractual terms imposed by Apple for the use of the iPhone,[211] and exist in other countries including the UK.[212] Such procedures are likely to lower the barriers to intervention in the market, which could have negative consequences for innovation and increase regulatory burdens; however, they are also likely to result in faster resolution than competition law proceedings, thereby reducing uncertainty in the market.

Recently, various initiatives have been launched by the Commission which aim to delve deeper into the competition issues raised by the development of online platforms. This includes a September 2015 consultation by DG Connect on the regulatory environment for platforms, online intermediaries, data and cloud computing and the collaborative economy[213], and the launch in May 2015 of a sector inquiry into e-commerce by DG Competition, which will gather data on the functioning of e-commerce markets to identify possible competition concerns.[214]

Finding 27. Although online markets are highly contestable, major players can benefit from *network effects* that may give them a form of market power in relation to suppliers including SMEs (advertisers and merchants) that depend on them. Discrimination, lack of transparency, and unfair contract terms are the main concerns in this context. Competition law could be applicable, but competition law is notoriously slow in reaching a conclusion. Some Member States have national legislation that allows the prohibition of unfair business practices, which provide an alternate avenue but with risks of its own. The Commission has launched a consultation concerning the regulatory environment for platforms and the collaborative economy.

5.2.4. Switching and customer lock-in

Competitive markets generally flourish in an environment in which there are few barriers to switching, enabling customers to easily move to a better deal. The concept of switching is well-understood for example in the context of broadband and voice services and is tightly regulated at EU and/or national level. In the relatively new environment of digital platforms, however, switching challenges have only recently been raised as concerns by customers[215], and mechanisms are still evolving to address these challenges.

[211] WSJ France probes Apple's contracts with mobile operators http://www.wsj.com/articles/SB10001424052702304526204579096712914402556.

[212] The UK's Competition and Markets Authority has the power to conduct market investigations and implement remedies

[213] DG Connect platform consultation https://ec.europa.eu/digital-agenda/en/news/public-consultation-regulatory-environment-platforms-online-intermediaries-data-and-cloud.

[214] DG Comp sector inquiry into e-commerce http://ec.europa.eu/competition/antitrust/sector_inquiries_e_commerce.html.

[215] In a 2014 Eurostat survey, 28% of enterprises cited difficulties in unsubscribing or changing service provider as a factor limiting usage http://ec.europa.eu/eurostat/documents/2995521/6208098/4-09122014-AP-EN.pdf. However, concerns over security breaches and insufficient knowledge about cloud usage ranked as more significant concerns at this stage.

a. The European Union

The concept of *portability* (retaining the customer's identifier when changing supplier) and support for *switching* are well understood in the context of telephone services. In particular, the EU Framework for electronic communications sets specific requirements for numbers used for telephone services to be ported within one working day, and provides details of the pricing conditions for portability.[216, 217] The Universal Service Directive also limits maximum contract periods for ECS provided to consumers to 24 months in order to avoid customer lock-in. Broadband services are often subject to switching proceedings at national level.

Online communications applications such as messaging and online VoIP are not subject to portability or switching requirements, but multi-homing (whereby customers subscribe to several online networks concurrently) may mean that such requirements are unnecessary.

However, the concept of portability becomes important for cloud services which involve *storing* customer data or content and applications owned by the customer. In these cases, the lack of the ability to readily move data can create significant issues for competition and for the ability of new entrants to gain a foothold in established markets. Relevant examples include:

- Cloud computing facilities such as *online office* or *personal locker* facilities;
- Social networking sites in which a large amount of user-generated content such as contacts, messages, photos and videos might be stored; or
- Online digital media services where customers purchase music, video and other media on one platform and may wish later to access and play such services on other platforms.

One response to such issues has been to generate standards with the aim of facilitating portability (see, however, the discussion of incentives for market players in Section 5.2.2, which raises an important caveat). For example the European Cloud Computing Strategy seeks to establish voluntary standards in a range of areas including those to support data portability between cloud platforms[218]. The DSM Strategy has also flagged the Commission's intention to "launch a European Cloud initiative" which will include consideration of switching of cloud service providers, but few further details are given.

The Council text for the GDPR, which is still under negotiation, goes further in proposing a legal right to data portability, where customers would have the right to receive personal data in a structured and commonly used format, and would have the right to transmit those data to another data controller.[219]

Questions around compatibility of digital media raise wider questions. On the one hand, compatible standardised formats would allow customers to play content for which they have bought the rights on any media player or device, avoiding lock-in; however,

---

[216] At the retail level, the cost should not act as a disincentive to switching and at the wholesale level, porting charges are required to be cost-oriented Article 30 USD.

[217] Fixed numbers may be ported to fixed services, and mobile numbers to other mobile services, but there is no general right to port fixed numbers to mobile services or vice versa

[218] European Cloud Computing Strategy http://ec.europa.eu/digital-agenda/en/european-cloud-computing-strategy

[219] Article 18 Council text draft GDPR http://data.consilium.europa.eu/doc/document/ST-9565-2015-INIT/en/pdf

standardised formats might also affect incentives for equipment manufacturers and applications developers to innovate, as their ability to profit from innovation would be reduced.

Data portability appears to be a promising direction, but a detailed comparison of benefits to costs is warranted. This is well beyond the scope of the current study.

b. The United States

In the US, as in Europe, there is a long-standing tradition of portability for traditional phone services, which also applies between fixed and mobile numbers; however, there are no overall provisions in place concerning data portability.[220] In this context, it will be interesting to see if the upcoming EU rules in the context of the GDPR, which will also apply to US-based firms, provide a de facto framework for data portability in the US.

Finding 28. Subject to a cost benefit analysis, the proposed GDPR provisions on data portability could provide a promising route to combat lock-in, thereby fostering switching between cloud providers and social networking sites (including potential new European entrants in this space).

5.3. Broadband policy

For European online services to flourish, it is necessary that Europeans (and for that matter, people all over the world) have good Internet access to the services. European broadband policy clearly has a role to play here.

Since we have analysed these issues extensively in several previous studies for the Parliament,[221] we will confine ourselves here to a brief review our main findings.

In terms of broadband deployment and adoption, Europe has many strengths that are often overlooked. We have achieved substantially universal coverage of basic broadband, while adoption in many EU Member States ranks among the very highest in the world. The price of basic fixed broadband in Europe is low among developed countries.

At the same time, European deployment and adoption of ultra-fast 100 Mbps and above fixed broadband services lag behind a number of global competitors, notably South Korea, Japan, and the United States. New fibre-based (FTTH) deployment in the US has largely stalled, but the US and Canada benefit from nearly ubiquitous deployment of cable (while cable is available to only roughly half of Europeans, and not at all in Italy or Greece). Deployment of high-speed LTE mobile broadband capability also lags many global competitors.

---

[220] There have been isolated examples, as in the case of obligations of the merged AOL / Time Warner to make AOL Instant Messenger interoperable with competing messaging services. These obligations on AOL are widely viewed as having been a dismal failure.

[221] J. Scott Marcus, Ilsa Godlovitch, Pieter Nooren, Dieter Eilxmann and Bram van den Ende with the support of Prof Jonathan Cave (2013): "Entertainment x.0 to boost Broadband Deployment", study prepared for the European Parliament's Committee on Industry, Research and Energy, at: http://www.europarl.europa.eu/committees/en/imco/studies.html#menuzone; and Anne Fleur van Veenstra, J. Scott Marcus, Jonathan Cave, Noor Huijboom, Dieter Elixmann, Annette Hillebrand, Rebecca Schindler and Veronica Horvath (2013): "Ubiquitous Developments of the Digital Single Market", study prepared for the European Parliament's Committee on Internal Market and Consumer Protection, Policy Department A, at: http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/507481/IPOL-IMCO_ET(2013)507481_EN.pdf. See also Francesco Caio J. Scott Marcus, and Gérard Pogorel (with the assistance of Vittorio Trecordi and Valerio Zingarelli) (2014), "Achieving the Objectives of the Digital Agenda for Europe (DAE) in Italy: Prospects and Challenges", a study on behalf of Prime Minister Enrico Letta, available at: http://www.governo.it/backoffice/allegati/74621-9208.pdf.

Have these deficits negatively impacted European online firms? Evidence is mixed. The ability of ultra-fast broadband networks to promote the growth of new services seems to be more subtle, or to operate over longer time periods, than many experts have assumed. Japan has some of the fastest broadband networks in the world (based on FTTP technology), and yet consumption of broadband data in Japan seems to be much lower than in the US (with only moderately fast cable networks), and also less than in the UK (with moderately fast FTTcab/VDSL and cable networks). Actual consumption seems to have more to do with Netflix in the US and with BBC catch-up video in the UK than with the speed of their respective networks.[222]

All of this suggests that demand side issues are at least as important as supply side. Trying to solve Europe's broadband deficits solely with supply side measures risks investing public money in order to build big, fast networks that remain largely empty for a long time.

Gaps in broadband adoption in Europe today typically do not reflect lack of availability, nor are they indicative of high prices. The main reason for Europeans not to subscribe to broadband at home today is that nobody in the household sees the need.[223] Supply side measures alone will not change this.

The declining number of fixed line subscriptions in Europe is primarily a demand side factor, and is of concern. Mobile services are not a complete substitute for fixed. The majority of data produced by ostensibly mobile devices appears in practice to be off-loaded to private Wi-Fi at home and at work, while public Wi-Fi and femtocell, a small cell that connects cell phones to broadband networks in a home or office setting, solutions seem to have promise. Survey data show that consumers use the mobile-capable device differently when Wi-Fi is available than when it is not.[224]

The relative lack of high speed mobile broadband deployment in Europe, however, clearly limits the ability of citizens to access these services from anywhere, and at any time. Fixed services are often adequate, and Wi-Fi based services are widely used from mobile devices, but truly ubiquitous access implies the ability to use services also when one is not in a big city, or when one is truly mobile (as distinct from merely being nomadic, i.e. moving from one stationary location to another). Moreover, for some services (such as emergency services, or the ability to contribute to crowd-sourced information on traffic), ubiquitous mobile access is essential.

Policy in Japan and Korea has explicitly recognised the need for mobile broadband; European policy does not. The Digital Agenda for Europe provides objectives for the availability and speed of broadband services in Europe, but there is no explicit goal in regard to the availability or take-up of specifically mobile services.

Finding 29. The availability and widespread adoption of high quality broadband, both in Europe and worldwide, is a crucial enabler for European online services.

[222] See J. Scott Marcus et al. (2013): "Entertainment x.0 to boost Broadband Deployment", op. cit.; and Francesco Caio et al. (2014), "Achieving the Objectives of the Digital Agenda for Europe (DAE) in Italy: Prospects and Challenges", op. cit.

[223] TNS Opinion and Social (2013), "Special Eurobarometer 396: E-Communications Household Survey", Fieldwork: February - March 2013. "The first reason given by two-thirds of these respondents for not having household Internet access was that no one in their household is interested in the Internet (65%). The cost of an Internet connection was mentioned by around one in five respondents (19%)… The third most common reason given was that the respondent and their household members did not know what the Internet was (7%)."

[224] Marcus, J.S. & Burns, J. (2013) 'Impact of traffic off-loading and related technological trends on the demand for wireless broadband spectrum', Study for the European Commission.

Finding 30. Europe stands very well in terms of deployment and adoption of basic broadband, but lags key global competitors in deployment of ultra-fast fixed broadband (especially at 100 Mbps and up) and in deployment of fast LTE-based mobile broadband.

Finding 31. Demand side deficits regarding broadband in Europe are even more serious than the supply side deficits.

Finding 32. The ability of ultra-fast broadband to promote growth of new online applications and services appears to be more subtle, or to operate more slowly, than many have assumed.

In terms of policy, market forces should drive the deployment wherever possible. State Aid should focus on areas that would probably not occur based solely on market forces, and should be used only cautiously and sparingly elsewhere. The principle of technological neutrality continues to be important, especially in establishing trade-offs between FTTP/FTTH networks (the fastest and most future-proof, but also the most expensive) versus still highly capable cable and FTTCab/VDSL networks – wherever possible, the choice of technology and the timing of upgrades should be driven by market forces. Wireless services will tend to be attractive relative to fixed mainly in areas that are less dense, while geosynchronous satellite services will tend to be of interest mainly in areas that are very remote and/or very sparsely populated.

Addressing the relative lack of ubiquitous fast (LTE) mobile broadband in Europe broadly raises the same issues, but also argues for fast and efficient release of spectrum to the market, including in the 700 MHz band. It would clarify the thought process, but would not necessarily result in major policy changes since these issues are already receiving considerable attention.

5.4. Managing data online

Data protection and security as well as the means to enable interception of data (such as browsing histories, online purchases, e-mail or messaging communications) for law enforcement purposes are important issues in the context of electronic communications as well as online services, because ECS and online providers all process personally identifiable data.[225] Moreover, online activities often involve the transmission of data (and potentially storage of data in the case of cloud services) cross-border. The management of online data is a particularly complex area with different rules applying in different countries and with differences in the treatment of managed vs online service providers. Privacy and security is an area in which the US is generally considered to have lighter touch and more harmonised requirements than in the EU; however, this is only partially correct, inasmuch as US regulation of privacy tends to be highly fragmented across state and sectoral rather than national lines.[226]

[225] In Europe, IP addresses are generally considered to be personal data. Further, OTT services can be based on subscriptions, including the provision of personal data and sometimes payment details.

[226] J. Scott Marcus, Neil Robinson, Joel Reidenberg, Yves Poullet, Adam Peake, Kenneth Carter, , Lisa Klautzer, Chris Marsden, Florence De Villenfagne, Franck Dumortier, Keisuke Kamimura, et al. (2007), "Comparison of Privacy and Trust Policies in the Area of Electronic Communications", a study prepared for the European Commission.

5.4.1. Privacy and security

Data protection and security rules aim to ensure that personal data are not misused or compromised, and that consumers are informed about breaches of their privacy. Data security in particular has been raised as a key concern by customers as regards cloud computing, as this involves the storage of customer data remotely by the cloud provider.[227]

Privacy and security issues come together in regard to the Safe Harbour provisions that have just been invalidated by the ECJ. We discuss this in Section 5.4.2.

a. The European approach

In Europe, privacy and security is considered a fundamental right for the consumer, and is governed by a complex set of legislation. Sectoral legislation (the e-Privacy Directive[228]) co-exists with horizontal legislation (Data Protection Directive/the upcoming General Data Protection Regulation[229]). The upcoming Network and Information Security Directive is also relevant.

The current EU Data Protection Directive 95/46/EC does not consider important aspects like globalisation and technological developments such as social networks and cloud computing sufficiently. The European institutions are currently finalising the the General Data Protection Regulation (GDPR)[230], which is expected to replace the Data Protection Directive from 1995. A key aim of the Regulation is to increase harmonisation, since the instrument of a Regulation has direct applicability and leaves less room for exercise of discretionary powers on the part of Member States, which, in the implementation of the Directive, has led to minor differences among EU Member States.

The GDPR extends the scope of data protection law to companies outside the EU when processing EU personal data. The 'right to erasure' provision will give greater control to citizens and consumers in managing their personal data. The European Council aims for adoption of the GDPR in 2015/2016 with enforcement starting in December 2017.

A RAND/TNO study for the European Parliament reviewing some of the effects of the existing Data Protection directive and the proposed GDPR on competition and innovation[231] found that the proposed restrictions on profiling negatively impact the position of EU versus US. Key US players are predominantly in the B2C market as opposed to B2B in the EU. It is easier for B2C players to obtain consent to use data from consumers. The study also found the new provisions affect small companies more than large companies with regard to data storage and processing requirements, notably for Big Data applications.

---

[227] Eurostat survey found that 44% of those not using cloud considered that security or privacy was a key barrier http://ec.europa.eu/eurostat/statistics-explained/index.php/Internet_and_cloud_services_-_statistics_on_the_use_by_individuals

[228] Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).

[229] Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

[230] See http://ec.europa.eu/justice/data-protection/.

[231] See Jonathan Cave, H.R. Schindler, Neil Robinson, Veronika Horvath, Sophie Castle-Clarke, A.P.C. Roosendaal, Bas Kotterink (2012), "Data Protection Review: Impact on EU Innovation and Competitiveness", study prepared for European Parliament´s Committee on Industry, Research and Energy (ITRE), Policy Department A, at http://www.europarl.europa.eu/RegData/etudes/etudes/join/2012/492463/IPOL-ITRE_ET(2012)492463_EN.pdf.

The most detailed provisions concerning data protection and security apply in the context of the e-Privacy Directive. According to Article 3(1) of this Directive, it applies to "the processing of personal data in connection with the provision of publicly available electronic communications services in public communications networks in the Community." This means that providers of managed services are clearly captured within its provisions, while OTTs in general are not[232]. As an example, ECS providers are required to take measures to ensure the security of their services and minimise the impact of security incidents on users as well as interconnected networks. They must notify relevant authorities as regards breaches of security – which may in turn refer such issues to ENISA[233]. For example, such breaches may apply to calls or e-mail or other services operated by ECS providers. Online providers are not subject to these requirements. This may mean in practice that an online e-mail service has different security requirements from a 'tied' e-mail service offered by an ECS. In view of anomalies such as these, the Commission has stated in the DSM Strategy that it will review the e-Privacy Directive to ensure a high level of protection for data subjects as well as a 'level playing field for all market players'. By implication, one option may be to extend the scope of the e-Privacy Directive.

It should be noted in this context that online service providers are still subject to data protection and security provisions under *horizontal legislation*. As *data controllers*, online service providers (alongside managed service providers) must meet horizontal requirements under the Data Protection Directive concerning data minimization, information handling, and must show legitimate grounds for the processing of the data. Article 13 of the DPD also sets out general requirements for data controllers to take appropriate organizational and technical measures to protect their data. In particular, safeguards must be taken to protect the data from being leaked or illegitimately accessed. The upcoming General Data Protection Regulation contains similar safeguards. A recent review by ETNO proposed to combine the remaining relevant articles of the e-Privacy directive into the GDPR rather than extending the scope of the e-Privacy Directive. This would mean a single Data protection and Privacy law governing the converged media landscape including OTTs[234].

In addition, digital service platforms may also be covered by security obligations envisaged in an upcoming Directive concerning Network and Information Security[235]. The proposed Directive would oblige 'key Internet enablers' including e-commerce platforms and social networks to assess risks and adopt appropriate and proportionate measures to ensure network and information security, as well as reporting significant incidents to the authorities. It is unclear at this stage what the final shape of these obligations on online providers would be. For example, it is understood from a statement following discussions between the Council and Parliament that agreement was reached that 'digital service

[232] However, the fundamental protection of confidentiality of communications, the articles on informed consent, and the article on SPAM in E-Privacy Directive Articles 5(1) and 13, cover everybody (all "persons other than users").

[233] At European level, the *European Network and Information Security Agency (ENISA)* plays a key role in advising Member State security authorities and the European institutions as regards network and information security.

[234] See http://www.think-digital.eu/?n=2015/306.

[235] Commission proposal for a Directive concerning network and information security http://ec.europa.eu/digital-agenda/en/news/commission-proposal-directive-concerning-measures-ensure-high-common-level-network-and.

platforms would be treated in a different manner from essential services';[236] however, the risk remains that a plethora of parallel rules covering security could further complicate the regulatory environment for online services in Europe.

A further data management issue affecting online providers has been the implementation of different national data protection regimes, despite the harmonisation of data protection rules at EU level since 1995, some of which have been restrictive as regards what is meant by personal data and the export of such data to third countries.

For example, in an interview conducted with a traffic applications provider, an IT manager noted that restrictive application of data protection rules made it difficult to export traffic data from Germany for the purpose of analysing travel times.[237] Similarly, there has been controversy over a proposed new data retention law in Germany, which would require companies to hold data within the country for law enforcement purposes.[238] Issues such as these have led to concerns around data flows, which are important for online services in general; moreover, it has led to acute concern for cloud services, which routinely involve the export and storage of data outside the end user's home country.

The forthcoming General Data Protection Regulation (GDPR) has the potential to reduce national divergence in implementation. It could therefore serve a positive role in addressing such issues, thereby improving the free flow of data. At the same time, there is a risk that the GDPR ultimately enacted might impose requirements that are overly restrictive. The details have been explored in multiple previous studies for the Parliament.[239]

Further efforts to smooth data flows may come from the Commission's 'free flow of data initiative' proposed in the DSM communication for 2016, which will aim to tackle restrictions on the free movement of data for reasons other than the protection of personal data, and address issues of ownership, usability and access to data.

Alongside legislative requirements, standards and codes of practice are likely to play an increasingly important role in promoting security and addressing barriers to the free flow of data. An example in this field is the development of an ISO standard relating to cloud security[240].

b. Approaches in Europe's trading partners

Data protection and security are considered by some stakeholders to be key areas where the EU approach is substantially more prescriptive than that in the US. Relative to online privacy, Europe considers privacy to be a right of the consumer. As such, it is regulated in an over-arching sector-independent way.[241] At the same time, some aspects of online

---

[236] Network and information security – understanding between Council and Parliament http://www.consilium.europa.eu/en/press/press-releases/2015/06/29-network-information-security/.

[237] See WIK (2015), "Applications and Networks: the Chicken or the Egg?"

[238] See http://www.computerworld.com.au/article/576052/german-gov-t-proposes-telecom-data-retention-law/.

[239] Jonathan Cave, H.R. Schindler, Neil Robinson, Veronika Horvath, Sophie Castle-Clarke, A.P.C. Roosendaal, Bas Kotterink (2012): Data Protection Review: Impact on EU Innovation and Competitiveness (2012), op. cit.

[240] ISO/IEC DIS 27017 Security techniques – code of practice for information security controls based on ISO/IEC 27002 for cloud services http://www.iso.org/iso/catalogue_detail?csnumber=43757

[241] J. Scott Marcus, Neil Robinson, Joel Reidenberg, Yves Poullet, Adam Peake, Kenneth Carter, Lisa Klautzer, Chris Marsden, Florence De Villenfagne, Franck Dumortier, Keisuke Kamimura, et al.

privacy are subject to detailed regulation (some would say overly detailed, as in the case of online cookies).

By contrast, the United States has no over-arching approach to online privacy; however, sector specific rules (for example, for medical records and for banking) can be intense.[242] In a previous study, US privacy advocates noted that penalties for privacy infractions were often higher in the US than in Europe.[243]

Big differences in approach emerge from the fact that the United States, while proposing a first-ever federal privacy law with a "Privacy Bill of Rights," still intends to rely on a variety of self-regulation (more precisely, co-regulation, since self-regulatory rules could not be enforced by law enforcement). The U.S. proposed rules do not contemplate a "right to be forgotten," a major feature of the EU proposal and one that First Amendment scholar Professor Jeffrey Rosen has labelled "the biggest threat to free speech on the Internet in the coming decade." Similarly, there is no right to "data portability" in the U.S. proposals as there is in the EU plan. The EU proposal contemplates broad jurisdiction to enforce its law, even extending to U.S. businesses without a physical presence in the EU, under certain circumstances. And even though the EU has borrowed the data breach notification idea from the United States, it proposes a presumptive obligation to provide notice within twenty-four hours of a breach, a time frame widely regarded as wholly unworkable by those who have worked under the U.S. data breach laws. Finally, the EU proposes a schedule of monetary fines of up to 2 percent of an entity's global worldwide turnover for violations of the proposed Regulation – an amount that many stakeholders view as unreasonable due to the discretion given to enforcers in assessing such a fine.

In Brazil, the *Marco Civil*[244] limits retention of user data, and seeks to guarantee the inviolability and secrecy of user communications except pursuant to court order. It both limits retention and prohibits disclosure of call logs and other information for purposes of law enforcement except pursuant to court order. At the same time, in the interest of freedom of expression, it limits the liability of service providers in regard to content that they carry, provided that they respond in a timely fashion to remove materials that are found to be illegal.

(2007), "Comparison of Privacy and Trust Policies in the Area of Electronic Communications", a study prepared for the European Commission.

[242] Differences from one state to another can also be enormous.

[243] J. Scott Marcus et al. (2007), "Comparison of Privacy and Trust Policies in the Area of Electronic Communications", op. cit. This claim is probably correct, as far as it goes. Related questions that are difficult to answer relate to the degree to which these higher penalties actually deter bad conduct. One might also argue that high penalties are a normal consequence of the difference between Anglo-Saxon common law system and a European continental system.

[244] For an informal English translation of the Marco Civil, see https://www.apc.org/en/blog/marco-civil-brazilian-internet-bill-rights-english.

Finding 33. Data protection and security are considered by some stakeholders to be key areas where the EU approach is substantially more prescriptive than in the US. An important difference is that Europe considers privacy to be a right of the consumer, and therefore over-arching rules (including the *right to be forgotten*) apply. In the US, there are no such over-arching rules, although sector-specific regulation can be intense, and differences from one state to the next can be considerable. Although it may help to address the inconsistencies in national treatment that impeded data flows, we fear the GDPR in its current form may prove burdensome. Another complexity with the EU regime is the overlay of sectoral under the e-Privacy Directive alongside horizontal legislation (and the upcoming Network and Information Security Directive).

5.4.2. Data retention, lawful interception and liability of intermediaries

Alongside the right to privacy, legislation on both sides of the Atlantic has sought to ensure that data is retained and made available to law enforcement agencies where needed to tackle serious crime and the threat of terrorism. In this context, rules have also been established to define the role and liability of intermediaries such as search engines and email providers as regards the removal of illegal content.

a. The European approach

An important principle established in the e-commerce Directive is that providers of network access or information society services that consist in the transmission of information provided by a recipient of the service are not liable for the information transmitted provided they do not initiate, select the recipient or modify the information.[245] Service providers must still abide by orders of national courts or administrative authorities to address infringements (e.g. by removing unlawful content) under national law; however, the 'mere conduit' status implies that they do not have an obligation to actively monitor such content.

The Commission has suggested in the DSM Strategy that they will investigate "whether to require intermediaries to exercise greater responsibility and due diligence in the way they manage their networks and systems – a duty of care". The Commission also highlights discrepancies and inefficiencies in the national practices followed when removing illegal content, implying that proposals to harmonise such solutions are being contemplated.

If pursued, these developments would be likely to have mixed effects on online service providers. On the one hand, efforts to harmonise procedures for law enforcement would simplify the process for cross-border service providers. On the other hand, ISPs claim that changes to the principle of 'mere conduit' could imply significant additional administrative burdens and legal risks for online providers[246], which could be especially burdensome to smaller companies.

ECS providers were also subject to specific EU rules governing *data retention* in accordance with Directive 2006/24/EC[247], which required traffic data to be retained for purposes of law enforcement and intelligence. However, some countries opposed the Directive as they considered it to be a disproportionate infringement of privacy rights of citizens (e.g. Germany, unconstitutional BVfG). Ultimately, the Directive has been

[245] Mere conduit provisions – article 12 e-commerce Directive.
[246] See EuroISPA statement http://www.euroispa.org/success-dsm-strategy-will-depend-innovation-friendly-intermediary-liability-environment/.
[247] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:105:0054:0063:EN:PDF.

declared unlawful by the ECJ.[248] Despite this ruling, however, national implementations remain or are in process.[249]

Although all relevant online data can be captured by providers of Internet connectivity – increasing use of encryption technologies has again raised questions over whether such data could always be interpreted by law enforcement authorities.

Finding 34. The Commission has proposed to investigate whether intermediaries which are currently protected from liability for illegal content by 'mere conduit' status should be subject to a duty of care. The implications of such a change on online service providers could be significant, both as regards legal risk and administrative burdens, and therefore should be investigated. At the same time, the Commission has suggested a harmonisation or standardisation of the multitude of different regimes aimed at law enforcement, which could reduce the burden on online service providers.

b. Rules in the US

The United States has explicit rules in place regarding data retention for law enforcement (the *Communications Assistance for Law Enforcement Act (CALEA)*)[250] and for national intelligence (see the *Foreign Intelligence Surveillance Act of 1978 (FISA)*, which has subsequently been amended multiple times).[251] These rules are largely a response to various excesses in the past on the part of US intelligence agencies, and reflect the work of the Church Committee of the US Senate circa 1975.

CALEA was originally intended to cover only voice communications; however, rulings of the US FCC (the US NRA) in 2005 and 2006 effectively extended CALEA to also cover facilities-based broadband Internet access services, as well as VoIP calls when interconnected with the public switched telephone network. The principles of CALEA are broadly similar to those of European law, in that interception of content is generally permitted only pursuant to reasonable grounds for suspicion as evidenced by a warrant signed by an impartial magistrate. Retention of call-identifying information is subject to less stringent controls.

FISA operates under broadly similar rules; however, a number of concerns are relevant from a European perspective. First, FISA provides protection only to US citizens and residents, and thus provides no meaningful protection to Europeans or other US allies. The review to determine probable cause is conducted without transparency by a special FISA court that very rarely rejects requests. There is reason to question whether the US government actually adhered to the US FISA law during the George W. Bush years. Finally, the revelations of former NSA contractor Edward Snowden suggest that the scope of data collected today is simply immense.[252]

Due to concerns over these apparent systematic excesses, the European Court of Justice (ECJ) has just declared as invalid the Safe Harbour arrangements that the European

[248] The Court of Justice Declares the Data Retention Directive to be invalid, at http://curia.europa.eu/jcms/upload/docs/application/pdf/2014-04/cp140054en.pdf.

[249] For example, in the Netherlands, the government is working on a new form of data retention legislation, after the national legislation was rejected by the courts.

[250] Public Law No. 103-414, 108 Stat. 4279, codified at 47 USC 1001-1010.

[251] Public Law 95–511, 92 Stat. 1783, codified at 50 U.S.C. ch. 36.

[252] See New York Times (2015), "AT&T Helped U.S. Spy on Internet on a Vast Scale", at http://www.nytimes.com/2015/08/16/us/politics/att-helped-nsa-spy-on-an-array-of-internet-traffic.html?_r=0; ProPublica (2015), "NSA Spying Relies on AT&T's 'Extreme Willingness to Help'", at https://www.propublica.org/article/nsa-spying-relies-on-atts-extreme-willingness-to-help; and J. Scott Marcus (2006), unredacted declaration as an expert witness in Hepting et. al. versus AT&T Corp. available at: http://www.eff.org/files/filenode/att/SER_marcus_decl.pdf.

Commission put in place in the year 2000 (Decision 2000/520) in order to facilitate data interchange between Europe and the United States.[253]

Many European firms, including online and OTT startups, have depended on these now-invalid Safe Harbour provisions in order to conduct transatlantic operations. There is thus an urgent need to put new arrangements in place; however, it is exceedingly difficult to see how this could be achieved in practice.

The opinion of the Advocate General says in part that "… a third country cannot in any event be regarded as ensuring an adequate level of protection, and this is all the more so since the safe harbour scheme as defined in the Commission decision does not contain any appropriate guarantees for preventing mass and generalised access to the transferred data. Indeed, no independent authority is able to monitor, in the United States, breaches of the principles for the protection of personal data committed by public actors, such as the United States security agencies, in respect of citizens of the EU."[254] Given the lack of transparency and visibility into US surveillance for purposes of national intelligence, and the apparent track record to date, how could US compliance with any arrangement ever be verified?

5.5. Consumer protection

Consumer protection measures which affect managed and/or online digital services include requirements for vendors to make prices and contractual terms transparent, contractual safeguards (such as 'cooling off' periods), restrictions on harmful content and obligations to offer access emergency services. Within Europe, more stringent consumer protection rules apply to services which fall under sectoral legislation covering telecommunications and audiovisual services than apply to online service providers which do not fall within the scope of sectoral legislation. In general, European standards for consumer protection tend to exceed those in the US.

5.5.1. Requirements on audiovisual media service providers

Sectoral obligations applying to audiovisual media service providers are mainly associated with transparency (for example regarding advertising), public interest and the accessibility of content.

Within the EU, audiovisual service providers falling within the definitions in the AVMS Directive have obligations to ensure that commercials are clearly recognisable and distinguished from editorial content.

In addition, Member States must ensure that online providers which offer 'information society services', must ensure that commercial communications are clearly identifiable and that the source of the commercial is identifiable[255].

Online content and video providers which do not meet AVMS or ISS definitions do not have specific ex ante obligations around the transparency of commercials. It is interesting in this respect that some of the complaints around the alleged abuse of dominance by Google concern a lack of transparency over the nature of results data displayed, and whether it is purely based on algorithms or otherwise selected.

[253] See ECJ (2015), PRESS RELEASE No 106/15: Advocate General's Opinion in Case C-362/14: Maximillian Schrems v Data Protection Commissioner. For the ECJ decision, see http://curia.europa.eu/juris/document/document.jsf?text=&docid=169195&pageIndex=0&doclang=en&mode=req&dir=&occ=first&part=1&cid=116872.

[254] See ECJ (2015), Press Release, op. cit.

[255] Article 6 e-Commerce Directive

Member States are also required to ensure that services provided by AVMS providers within their jurisdiction do not contain material which incites hatred based on race, sex, religion or nationality. There are also obligations which aim to ensure that commercials do not prejudice health or safety and that children are protected from exposure to potentially harmful content.

Online content providers which do not meet AVMS definitions are not in general subject to these requirements; however, the e-commerce directive encourages *codes of conduct* to be developed by ISS providers including regarding the protection of minors and human dignity[256]. In practice 'notice and take-down procedures' are often deployed at national level for offensive online content. The European Commission began an initiative and expert group on 'notice-and-action' procedures in 2012[257].

5.5.2. Contractual safeguards for communication services

Contractual safeguards for communications services, is an area where EU providers are generally subject to more stringent controls than those in the US.

a. The EU environment for ECS compared with OTT

Operators that offer Electronic Communications Services (ECS) are required under the EU Regulatory Framework to offer contracts to consumers that include details regarding pricing, duration, availability of access to emergency services, compensation in case of service problems, and dispute resolution. National Regulatory Authorities (NRAs) can also set requirements for operators to publish information about prices and service quality.

Online providers that do not fall within ECS definitions do not have such specific obligations as regards contracts; however, under the e-commerce Directive, ISS providers are obliged to make available to their users their contact details and VAT number. Where ISS refer to prices, these must be indicated "clearly and unambiguously" and must indicate whether they are inclusive of tax and delivery costs[258].

Alongside these sectoral rules, the rights from the Consumer Rights Directive (2011/83/EC) can be invoked by consumers in relation to all services. These include the right to withdrawal from contract within 14 days after the delivery of a good or service. In case of downloading or streaming, however, this opportunity stops when the download or stream starts. The 'good' is then consumed and cannot be returned. The CRD also describes obligations for the service provider. These include the requirement to provide clear and comprehensive information on the costs and fees applicable to a service, as well as information concerning the right to withdraw, including standard forms.

Although, as an essential enabling service, broadband connectivity may warrant specific contractual protections and transparency obligations[259], there are questions as to whether – for voice and messaging - sectoral rules are needed in addition to the more generic requirements of the CRD.

A further issue raised by the Commission in its DSM Communication is that while some aspects of consumer and contract law have already been fully harmonised for online

[256] Article 16 E-commerce directive
[257] http://ec.europa.eu/internal_market/consultations/2012/clean-and-open-internet_en.htm.
[258] Article 4 e-commerce Directive.
[259] For example, debates around net neutrality imply a need for greater transparency on traffic management.

sales, other aspects (including remedies for defective goods) are subject only to minimum harmonisation, resulting in different approaches at a national level. The Commission proposed to address this by putting forward measures that would allow traders to rely on their national laws based on a focused set of key mandatory EU contractual rights for domestic and cross-border online sales of tangible goods. The Commission has also proposed to establish an EU-wide online dispute resolution platform and improved Regulation on Consumer Protection Cooperation. In the draft report concerning the DSM, the European Parliament proposes to go further, and suggests a "full harmonisation of the legal framework governing online sales".[260]

b. The position in the US

The US regime applying to consumer protection is substantially lighter than that applied to communications service providers in the EU. In the US, there is no legislation entitling consumers to minimum contractual rights with regard to the use of telecom as well as OTT services, and regulatory monitoring of consumer prices of communications services is patchy.

c. Case study on emergency services

Providers of Voice over IP (VoIP) services tend to be lightly regulated in most jurisdictions; however, there are subtleties in terms of (1) access to telephone numbers[261], (2) access to emergency services, and (3) lawful intercept (interception of communications for purposes of law enforcement, as distinct from for purposes of national security).[262] The example of emergency service obligations on VoIP providers in the US offers important lessons as regards the possible effects of extending rules applicable to traditional service providers to online service providers.

Pure VoIP services between digital devices (consider, for example, Skype) tend not to be subject to obligations to support access to emergency services (in Europe, 112 calls). In the United States, however, providers of VoIP services between telephones with numbers (such as Vonage) were subjected to the same emergency services obligations as traditional telephone companies. This obliged them to acquire access to the emergency control centres – which, however, was available only from traditional telephony incumbents, who had no motivation to make the access available at a cost-based price. A well-meaning but (some might argue) misguided FCC rule thus had the effect of nearly exterminating this segment of the US VoIP market.[263]

---

[260] Paragraph 8 Draft report 2015/2147.

[261] VoIP providers using numbers from a national numbering plan are typically subject to the same obligations as ECS providers under the EU Framework for Electronic Communications. In the United States, providers of VoIP services are for most purposes regulated as *users* of electronic communication services rather than as *providers* of the services. This means that the VoIP service provider is not entitled to directly obtain telephone numbers from the FCC; however, in most cases, VoIP providers are able to contract with conventional service providers to obtain these numbers, together with other telecommunications services that they need, at prices that presumably are competitive and fair.

[262] Dieter Elixmann, J. Scott Marcus, Christian Wernick, with the support of Cullen International (2008), "The Regulation of Voice over IP (VoIP) in Europe", a study prepared for the European Commission, 19 March 2008, available at: http://ec.europa.eu/information_society/policy/ecomm/doc/library/ext_studies/voip_f_f_master_19mar08_fin_vers.pdf.

[263] J. Scott Marcus (2006), "Voice over IP (VoIP) and Access to Emergency Services: A Comparison between the U.S. and the UK", *IEEE Communications Magazine*, August 2006, available at http://www.comsoc.org/livepubs/ci1/public/2006/aug/cireg.html.

Finding 35. Variations in consumer protection rules in Europe (and the fact that these are applied in the country of residence) are likely to present a barrier for SMEs in expanding cross-border. Differences in consumer protection rules applying to traditional as compared with online services may also create confusion for consumers and competitive distortions. Emergency service access remains an important service that must be assured. However, the extension of emergency service access requirements to VoIP providers in the US provides a salutary example of the potential effects of extending regulation to new service providers.

5.6. Taxation and levies

Taxation and levies can create anomalies and imbalances in several ways. Where country of origin rules apply, differences in VAT systems can lead companies to 'shop around' for the most attractive regime[264], while country of destination systems lead to administrative burdens on providers and may impede cross-border provision. Taxes and levies can also have perverse effects where requirements lie on one set of providers (e.g. managed service providers), while those providing similar online services are exempt.

a. The European Union

The Commission proposes to introduce "a VAT threshold to help online start-ups and small businesses".[265] This appears to be warranted and appropriate, and is likely to have positive effect in promoting the creation and initial growth of OTTs, online services, and start-ups.

In Europe, anomalies in VAT affect traders in many different ways. Rates differ among the Member States, and often differ between digital products and physical products with which they compete.[266] Compliance costs are substantial, evasion appears to be widespread.[267] Most recently, since the country of destination rules for VAT on telecommunications, broadcasting and electronic services came into effect on 1 January 2015 (with many positive effects, but with certain negative implications for e-commerce), cross-border traders have been faced with significant additional administrative hurdles and cost. At the same time, they face competition from traders outside the EU, which are exempted from charging VAT to private customers under the 'small consignment import exemption' (i.e. *low value consignments relief*, often referred to as *LVCR*).

A 2012 study on behalf of the European Parliament[268] expressed a wide range of concerns regarding differences in VAT rates within the EU. "The differences exist in three

[264] Amazon registered as a Luxembourg company paying that country's VAT charge of just 3% on good exported elsewhere until the European Commission intervened to close what was presented as a 'loophole'. See http://www.theguardian.com/technology/2012/oct/24/amazon-tax-loophole-ebooks.

[265] European Commission (2015), "Modernising VAT for cross-border e-commerce: Commission launches public consultation", at http://europa.eu/rapid/press-release_IP-15-5719_en.htm. The Commission observes: "In its original proposal [for changing to 'place of supply' rules], the Commission had included a VAT threshold to exempt smaller businesses from the changes, but Member States rejected that option. The Commission would like to put that option forward again in order to support the EU's start up and smallest companies."

[266] Helge Sigurd Næss-Schmidt et al. (2012), "Simplifying and Modernising VAT in the Digital Single Market for e-Commerce", study prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, Policy Department A , at http://www.europarl.europa.eu/RegData/etudes/etudes/join/2012/492432/IPOL-IMCO_ET(2012)492432_EN.pdf.

[267] Ibid.

[268] Ibid.

dimensions. First, there are substantial differences between Member States in the VAT rates that they apply to the same types of typical e-commerce products. This provides, in some circumstances, an incentive for private consumers to source products from the country with the lowest VAT rate. Second, physical variants of products are in a number of cases taxed at lower rates than the digital variants within countries: a classic example is physical versus electronic books. This provides a VAT-induced incentive to choose the physical variants. It also creates the so called mixed supply problem: if two products with different VAT rates are sold by the same supplier to a customer: what VAT rate should apply? For instance, a consumer may acquire the right to both a hardcopy newsletter/magazine and access to an online softcopy version for a single price. Third, the VAT treatment that can apply to certain suppliers can provide the supplier with an advantage in the distribution or facilitation of the e-commerce trade: universal post service providers and certain payment facilitators may be able to apply VAT exemptions to their services, respectively, transporting physical goods and providing payment facilities."

The authors of the 2012 study go on to argue that "equal treatment of physical and digital version of like products should be priority number one in this context. The unequal treatment embodied in the current VAT directive (1) leads to distortions to the internal market, (2) limits the environmentally friendly advantages of digital goods vis-a-vis physical variants, and (3) distorts consumer choice. It also is at conflict with underlying objectives which have motivated the use of reduced rates on cultural or other merit-based products, namely to make such products (for example books), affordable for a wider population."

Meanwhile, the low value consignments relief (LVCR) exemption exists in order to reduce administrative burden on customs authorities. It is at the discretion of the Member State, but is implemented in all Member States. The maximum value for the exclusion has been increasing over time, and is set at the maximum value permitted under European legislation in most.[269]

A recent study by EY on behalf of the Commission[270] found that the LVCR can lead to distortions of trade within Europe. The LVCR promoted the growth of fulfilment centres in the Channel Islands (which are British Crown Dependencies but not part of the United Kingdom), the Åland Islands (an autonomous region of Finland comprised of more than 6,500 islands located between Finland and Sweden),[271] Switzerland and Gibraltar. All of these regions are within Europe, but not part of the VAT territory of the EU.

The Commission has proposed to bring forward legislative proposals in 2016 that aim to reduce administrative burden and close loopholes. Among the Commission's proposals is to "[remove] the VAT exemption for the import of small consignments from suppliers in third countries".[272] This may prove to be challenging, since the LVCR serves a legitimate purpose in reducing administrative burden at the same time that it introduces distortions and opportunities for arbitrage.

---

[269] EY (2015), Assessment of the application and impact of the VAT exemption for importation of small consignments, Final Report, May 2015.

[270] Ibid.

[271] Industry is said to claim that millions of publications are printed in Europe, then delivered in bulk to the Åland Islands from which they are shipped to consumers in Europe after claiming VAT exemption. This practice is somewhat akin to "tromboning" of voice calls in telecommunications. Ibid.

[272] European Commission (2015), "Modernising VAT for cross-border e-commerce: Commission launches public consultation", at http://europa.eu/rapid/press-release_IP-15-5719_en.htm.

A separate issue relates to differences in the levies charged to traditional ECS providers as compared with online service providers in the context of the EU framework for electronic communications. Under the terms of the Authorisation Directive[273] and Universal Service Directive[274], ECS providers may be required to contribute to the costs of financing the national regulatory authority (NRA).[275] They may also be required to contribute to a pool to reimburse the net costs incurred by the provider of universal service obligations, if these are considered to present an "undue burden".[276] OTT providers (whether ISS or otherwise) are usually not subject to such financing obligations.

Financing obligations are linked to the remit of NRA's supervisory powers under the EU Framework for Electronic Communications, and to the current scope of universal service, which focuses on telephone and Internet services. There are wider questions around whether the current scope of the EU Framework and Universal Service Obligations are appropriate.[277] Reducing the scope of the EU communications framework to connectivity (as opposed to applications such as telephony running over a connection) would also affect the scope of financing obligations.

Funding the net cost of universal service out of general revenues, rather than through a pool among the network operators, would introduce fewer distortions than current practice. This is explicitly contemplated in the Universal Service Directive, but we are not aware of any Member State that has ever implemented it.

b. The United States

Relative to taxation, the United States has long had a Congressional moratorium on taxes on Internet access and on Internet-specific taxes, but not specifically on services provided over the Internet, under the *Internet Tax Freedom Act of 1998*.[278] It also bars imposition of multiple taxes on e-commerce.

Where the purchased resides in the state where the e-commerce firm is based, one would expect that sales tax will be collected. In the United States, state and local sales tax is in principle also applicable to "remote sales" (e.g. from another state) by e-commerce; however, these provisions tend to be unenforceable unless the merchant has a physical presence in the state that seeks to impose the sales tax. A substantial fraction of the sales tax that is nominally due is not in fact collected.[279] The degree to which sales tax is actually collected interstate today is not altogether clear.

---

[273] Article 12 of the Authorisation Directive.

[274] Article 13 of the Universal Service Directive (USD).

[275] Under the terms of the Universal Service Directive, funding to compensate the net cost of providing universal service could come from general revenues; however, no Member State does this in practice.

[276] There is a strong argument to be made that universal service payments (as well as charges for authorization) should be waived altogether for small enough market players. BEREC views this as best practice in those Member States that implement universal service funds.

[277] J. Scott Marcus, Ilsa Godlovitch, Pieter Nooren, Dieter Eilxmann and Bram van den Ende with the support of Prof Jonathan Cave (2013), "Entertainment x.0 to boost Broadband Deployment", study prepared for the European Parliament's Committee on Internal Market and Consumer Protection, Policy Department A, at: http://www.europarl.europa.eu/committees/en/imco/studies.html#menuzone.

[278] The Internet Tax Freedom Act of 1998 is not a separate law; rather, it is Title XI (Moratorium on Certain Taxes) of Public Law 105–277. See: http://www.gpo.gov/fdsys/pkg/PLAW-105publ277/pdf/PLAW-105publ277.pdf.

[279] See US Congressional Budget Office (2003), "Economic Issues in Taxing Internet and Mail-Order Sales", at: http://www.cbo.gov/sites/default/files/10-20-internettax.pdf.

It is clear that a true moratorium would avoid the need (for domestic US sales) for merchants to determine which of myriad taxes apply to individual online sales.

The *de facto* moratorium on sales tax on interstate sales represents a financial benefit to online merchants in comparison to conventional "brick and mortar" merchants. It roughly offsets the disadvantage that they face in the form of shipping costs for the goods that they sell. At the same time, it could just as well be seen as a government induced competitive distortion.

Finding 36. The "place of supply" principle for VAT in the EU has created costs and challenges for cross-border businesses, while non-EU traders shipping low value items are exempt from these charges. At the same time, managed service providers face levies in relation to the electronic communications framework which are not applied to OTT providers which may offer similar services. US online providers benefit from a de facto moratorium on sales tax for interstate sales, due to enforcement challenges in collecting tax.

5.7. Copyright and geo-blocking

Europe is clearly at something of an intrinsic disadvantage relative to some of our global trading partners and competitors. Europe is divided into multiple countries, and also into multiple language groups. In cultural terms, this represents a strength (which is in fact recognised in the TFEU); however, it also means that global competitors such as the United States, China, India, and Brazil have domestic markets that are larger geographically and larger in terms of population than that of any single European Member State. Achieving synergies and scale economies by reaching across national borders has consequently always been among the objectives of the European Union.

Copyright and geo-blocking are among the impediments to cross-border synergies. They affect much of e-commerce, but have special relevance to audiovisual content.

Issues of fragmentation among national and linguistic lines are obviously also relevant. These are even more difficult to address.

The film sector in Europe is large in scale. Nonetheless, despite the European Union's prodigious output of audio-visual content, the EU does not achieve the commercial success that might be desired. In 2008, for instance, the European cinema sector produced 1,142 feature films compared to just 520 in the USA.[280] US films consistently account for more than 60% of cinema admissions within the EU, more than twice as much as for European films (see Table 5). US enterprises also accounted for the majority of fictional content on European television screens.

[280] J. Scott Marcus, Stephen Adshead, and Gilles Fontaine, et al. (2011): "Impact Assessment integrating ex ante evaluation requirements in view of the preparation of a proposal for the next MEDIA Programme after 2013", report for the European Commission.

Table 5. Cinema admissions in the EU.[281]

Region	2007	2008	2009	2010	2011	2012
U.S.	62.6%	65.6%	67.1%	68.0%	60.1%	61.1%
European films	28.1%	28.2%	26.7%	25.3%	28.5%	35.2%
Europe / U.S. inc14	7.5%	4.4%	4.2%	7.9%	9.7%	2%
Others	1.8%	1.8%	2.0%	1.3%	1.6%	1.6%

Few European works get much circulation outside of their country (or language) of origin. Non-national European films account for only some 12% of EU cinema admission market share.[282]

In terms of the commercial success of the sector, the large number of films is both a strength and a weakness. Compared to Hollywood films, most European films have small production budgets, low levels of distribution, and small audiences. Structurally, the European industry is highly fragmented, comprising large numbers of "prototype" film production companies and small-scale distributors and exhibitors.

The challenges thus have less to do with the volume of production, and more to do with what is produced, and for what audience, and with how it is distributed. These challenges are presumably compounded by complex issues involving geographic blocking, release windows, and copyright, as we explain shortly.

These challenges may be further compounded by national film subsidy programmes that subsidise film distribution in the language of the Member State, suppressing incentives to reflect international marketing in the initial sales plan. In previous work,[283] we found that support to the European film industry increased from €1,766 million in 2005 to € 2,074 million in 2009,[284] representing a CAGR of 4%. About two-thirds of this funding is concentrated in the top five markets (France, Germany, Italy, the UK and Spain)[285] that collectively represented 62% of the films produced in the EU in 2009.[286] These subsidies presumably have a positive impact on cultural pluralism, but they may quite possibly have a little-appreciated negative impact on the global competitiveness of the European film industry.

Meanwhile, intellectual property rights (notably including copyright) are experiencing strain due to the transformation of media technology and markets. The issues with copyright are reasonably well understood, but difficult to deal with.

Copyright is also being progressively distorted over time as the duration for which rights apply is increased. When copyright was first enacted in the United States, for instance, the duration was 14 years. This relatively short duration represented an attempt to balance on the one hand rewards and incentives for the creator against the value of shared knowledge to the broader society. Copyright today often remains in place 50 to

[281] European Commission (2013), Impact Assessment Report, communication on State Aid for Films and other Audiovisual Works.
[282] Ibid.
[283] J. Scott Marcus, Stephen Adshead, and Gilles Fontaine, et al. (2011): "Impact Assessment integrating ex ante evaluation requirements in view of the preparation of a proposal for the next MEDIA Programme after 2013", report for the European Commission.
[284] European Audiovisual Observatory: Public Funding for Film and Audiovisual Works in Europe.
[285] European Audiovisual Observatory: Public Funding for Film and Audiovisual Works in Europe.
[286] Source: European Audiovisual Observatory - Yearbook Online Premium Service 2010.

100 years after the death of the creator. Clearly, this is no longer solely about incentives for the creator of content.

In its Digital Single Market (DSM) strategy,[287] the Commission committed to "… make legislative proposals before the end of 2015 to reduce the differences between national copyright regimes and allow for wider online access to works by users across the EU, including through further harmonisation measures. The proposals will include: (i) portability of legally acquired content, (ii) ensuring cross-border access to legally purchased online services while respecting the value of rights in the audiovisual sector, (iii) greater legal certainty for the cross-border use of content for specific purposes (e.g. research, education, text and data mining, etc.) through harmonised exceptions,(iv) clarifying the rules on the activities of intermediaries in relation to copyright-protected content and, in 2016, (v) modernising enforcement of intellectual property rights, focusing on commercial-scale infringements (the 'follow the money' approach) as well as its cross-border applicability." These proposals appear to be directionally highly appropriate, but one might well expect (as is often the case) that "the devil is in the detail".

Media content, especially audiovisual media, can and must play a pivotal role in the transformation and digitisation of European society. As we explained in our 2013 study for the ITRE Committee of the European Parliament[288] (and also in a 2014 study on behalf of the Prime Minister of Italy),[289] it is highly unlikely that European broadband objectives can be meaningfully fulfilled solely with *supply side* measures – it is necessary to complement current European approaches with measures on the *demand side* (see also Section 5.3).

Audio-visual media is the only application visible today that consumes enough data to make much of a change in this situation; however, audio-visual media in Europe suffers from handicaps in terms of outmoded copyright and intellectual protection, geo-blocking, and a range of production and distribution challenges. These problems collectively undermine the potential transformative power of audio-visual media in Europe.

The modernisation of copyright arrangements is a sensitive topic for the cultural sector;[290] nonetheless, they are of vital importance. Copyright issues (together with the related issue of geo-blocking, as we shortly explain) serve to impact cross-border usage, to limit the choices available to consumers, and to have price effects.

Linked to concerns about intellectual property rights is the issue of *geo-blocking*. Geo-blocking denies consumers in one Member State access to content in websites based in other Member States; alternatively, even if the consumer can reach the website, he or she may be unable to purchase goods or services from it. The consumer may be forced to purchase instead from a domestic website that offers higher prices. Some geo-blocking practices may be justifiable; others likely are not.

---

[287] European Commission (2015), "A Digital Single Market Strategy for Europe", COM (2015) 192 final, 6 May 2015.

[288] J. Scott Marcus, Ilsa Godlovitch, Pieter Nooren, Dieter Elixmann, Bram van den Ende, and Jonathan Cave (2013): 'Entertainment x.0 to boost Broadband Deployment', study prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, Policy Department A, at: http://www.europarl.europa.eu/committees/en/imco/studies.html#menuzone.

[289] J. Scott Marcus, Francesco Caio, and Gerard Pogorel (2014), 'Achieving the Objectives of the Digital Agenda for Europe (DAE) in Italy: Prospects and Challenges', a study on behalf of Prime Minister Enrico Letta, available at: http://www.governo.it/backoffice/allegati/74621-9208.pdf.

[290] See for example http://www.euractiv.com/sections/eu-priorities-2020/copyright-reform-or-cultural-nightmare-312745.

These practices can impact not only audio-visual content, but also the sale of tangible goods or of other services. They represent a source of burden and frustration for consumers, and a clear impediment to the Single Market.

These issues have been recognised for many years, and are in theory covered under existing legal provisions[291] but are lacking enforcement. Today, they appear to be taking centre stage. Geo-blocking features prominently in the Commission strategy document for the DSM,[292] and is likely to play an important role in the discussion over the coming years.

In its Digital Single Market (DSM) strategy,[293] the Commission rightly observes that there are many possible reasons for geo-blocking, some of which are well justified. The Commission has therefore, appropriately in our judgment, committed to take steps to mitigate or prevent *unjustified* geo-blocking.

The current focus on geo-blocking needs to be understood in the context of a long-standing debate over the effects of exclusive territorial licensing of rights within the EU. Exclusive territorial licensing could be viewed as a restriction on the development of a Single Market for audiovisual media services, holding back the growth of European service providers; however, others argue that it is the optimal system to monetise rights, supports investment in content production, and sustains cultural and linguistic diversity within the EU.

In addition to ensuring that AVMS providers under their jurisdiction_comply with certain copyright requirements,[294] Member States are required to promote the production of and access to European works by AVMS providers[295]. They must also ensure that exclusive rights for important events do not result in customers from being excluded from viewing these events. These requirements do not apply to OTTs which do not meet AVMS definitions, and intrinsically focus on ensuring such provision by EU-based AVMS providers, while providers such as Netflix based in other jurisdictions such as the US may not need to meet these requirements. The Commission has noted that in its review of the AVMS Directive, it will focus on whether its scope should expanded to cover new services, players and/or providers that fall outside its geographic scope. It has also flagged that it will pay particular attention to measures for the promotion of European works.

Finding 37. Europe is clearly at an intrinsic disadvantage relative to some of our global trading partners and competitors in the distribution of audiovisual content. Europe is divided into multiple countries, and also into multiple language groups. In cultural terms, this represents a strength (which is in fact recognised in the TFEU); however, it also means that global competitors such as the United States, China, India, and Brazil have domestic markets that are larger geographically and larger in terms of population than that of any single European Member State. Achieving synergies and scale economies by reaching across national borders has consequently always been among the objectives of the European Union.

[291] Article 20 of the 2006/123 Services Directive provides that Member States should ensure that the recipient is not made subject to discriminatory requirements based on his nationality or place of residence http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32006L0123.

[292] European Commission (2015), "A Digital Single Market Strategy for Europe", COM(2015) 192 final, 6 May 2015.

[293] European Commission (2015), "A Digital Single Market Strategy for Europe", COM(2015) 192 final, 6 May 2015.

[294] AVMS Directive, Article 8.

[295] AVMS Directive, Article 13.

6. ADDRESSING BARRIERS TO ONLINE SERVICES: WILL THE COMMISSION'S DSM STRATEGY DELIVER?

KEY FINDINGS

- The main challenges to European OTTs concern access to capital and the regulatory, cultural and linguistic fragmentation inherent in the EU.
- Fragmentation can have several dimensions. One is differences in rules between countries (which affects service providers where the country of destination principle is applied), while another is the presence of sectoral alongside horizontal regimes, which can result in different rules being applied to traditional and OTT providers offering similar services.
- Data protection and security, consumer protection, VAT and levies are all areas affected by fragmentation in both dimensions. A further challenge relates to the role of platforms as potential gatekeepers to other service providers and barriers to switching between platforms.
- The Commission's DSM Strategy goes significantly in the right direction; however, an overarching comment is that the focus of many (although not all) of the proposed initiatives centres on improving the experience for customers of online services, while less consideration is given in certain areas to the costs that this may imply for online service providers, including small service providers, for whom administrative burdens and legal risks present significant threats.
- There are a number of areas, including data protection and security, consumer protection and copyright, where we believe more could be done to achieve a streamlined approach across the Single Market. At the same time, there are other proposals which require more caution and a thorough cost benefit analysis due to the potential costs and legal risks these could apply on online service providers (including European firms).
- We have particular concerns about suggestions to extend the scope of sectoral measures on audiovisual media services and privacy as well as placing a 'duty of care' on intermediaries.
- A final and important concern is timing. As several of the initiatives are based on the adoption of EU legislation whose progress is likely to be time-consuming and whose outcome is uncertain, more should be done to assess whether legislation is needed and whether greater focus could be given to enforcement of existing rules in parallel or instead.

This chapter draws together the analysis from previous chapters to identify the main costs and barriers holding back the expansion of OTTs and online service providers in Europe, including regulatory challenges. It then summarises and evaluates the European Commission's DSM Strategy in addressing these barriers.

- Section 6.1 describes the most pressing commercial and regulatory concerns which warrant attention.
- Section 6.4 summarises the Commission's DSM Strategy and presents our view.

6.1. The main barriers to European OTT scale-up

Our analysis in Chapters 4 and 5 highlights a number of challenges to the expansion of online services within Europe, including the scale-up of EU-based startups. These can be categorised into three segments. In each case the challenges are 'horizontal' – deterring

cross-border entry or creating costs which exceed those potentially faced by start-ups in jurisdictions such as the US.

6.1.1. Access to capital

Firstly, we observe that the European capital market does not cater well to the needs of potential scale-ups. This challenge is set to intensify as startups seek to access capital to support their entry into vertical markets and the Internet of Things (IoT). While new initiatives are being launched such as the Capital Union[296] and EFSI, the time frame for implementation is slow.

In the meantime, this provides an important point of weakness compared with the US. For example, we note that there is five times less risk capital available in Europe than in the US. There may be various causes, including the focus of bank loans being on revenues rather than the returns available from 'exit'. Venture capital markets may also be more disjointed compared with the US.

6.1.2. High level barriers

A second core challenge concerns the fragmented, and sometimes comparatively heavy-handed, regulatory landscape in the EU which impedes European startups as well as established national players from taking advantage of the reach offered by online services through cross-border expansion. This concerns in particular varying rules concerning consumer protection and different VAT regimes – both of which are governed by the 'country of destination' principle. The cost of complying with these differing regimes is likely to be proportionately more burdensome for SMEs than for large firms which have already reached scale in other global markets.

Regulatory fragmentation also serves to disadvantage European firms at the expense of those based in more homogenous markets. At least for sales tax, the US offers a much less burdensome environment.

6.1.3. Barriers to free flow of data and content

A third and crucial barrier concerns the challenges associated with moving data and content across the single market. Data localisation requirements present a barrier to cloud computing – which is especially costly for smaller firms seeking to enter new markets.

Meanwhile, it is clear that due to its rich cultural and linguistic heritage (which in most respects is a European strength), Europe is at an intrinsic disadvantage relative to some of our global trading partners and competitors in the production and distribution of audiovisual content. Despite producing more content, European content producers achieve less reach. Efforts to address these issues by mandating national Governments to encourage the promotion of European works by providers under their jurisdiction are unlikely to provide effective outcomes in an increasingly globalised online distribution environment.

6.2. Challenges across the value chain

In addition to the core horizontal challenges facing European online start-ups, Europe's regulatory regime is further complicated by vertical challenges which may put players at one point in the value chain at a disadvantage compared with others.

[296] European Commission (2015), Action Plan on Building a Capital Markets Union, COM(2015) 468 final.

As discussed in Section 5.2, we are not generally of the view that there is a need for new actions to address supposed competitive imbalances between network operators and OTTs. To the extent that concerns exist at *retail* level, they should be addressed in the just-enacted TSM Regulation rules on net neutrality, while any *wholesale* interconnection payment issues could in theory be examined by NRAs under existing legislation (bearing in mind, however, that we do not see evidence of any serious problem at present).

We do see, however, that sectoral legislation applying to 'electronic communication service' providers or audiovisual media providers can result in traditional service providers facing additional or more stringent, compared with OTTs offering services which may increasingly be seen as substitutes by consumers.

6.3. Competition concerns in the online environment

Legislators have been made familiar with the types of competition concern which may affect the telecom industry, and indeed competition concerns that may arise between telecom providers and OTTs. Number portability is well-established in telecoms, and Net Neutrality rules have recently been settled. A further question, however, relates to the competitive environment for online services. Digital services are generally characterised by dynamic markets and creative destruction. However, one concern that has been raised is that anti-competitive conduct by dominant platforms may stifle competition from smaller European online players or negatively affect businesses of all kinds which rely on these platforms to market their business or distribute their products. Another concern is that difficulties porting data could impede switching, thus affecting customers' ability to shop for cloud services, as well as European entrants' ability to gain a foothold in this expanding market. The proposed GDPR provisions on data portability could provide an important step forward in this respect.

Although clearly important to the future of the digital single market, we do not cover issues concerning telecommunications network regulation (including spectrum) in this study.

Finding 38. The main challenges to European OTTs concern access to capital, barriers to expansion due to fragmented requirements on consumer protection and VAT and barriers to the free flow of data and content. Another concern is the presence of sectoral regimes alongside horizontal regimes, which can result in different rules being applied to traditional and OTT providers offering similar services. A further challenge relates to the role of platforms as potential gatekeepers to other service providers and barriers to switching between platforms.

6.4. The Commission's Digital Single Market (DSM) strategy

In this section, we discuss the Commission's DSM strategy and our assessment of it.

6.4.1. The DSM strategy

It is important to note that the Commission's DSM Strategy follows a number of previous initiatives. These include the Digital Agenda for Europe, which was adopted as part of the EU 2020 Initiative in 2010. This was followed by European Parliament Resolutions in 2012 and 2013 concerning completing the Digital Single Market[297] and European Council Conclusions

[297] See European Parliament resolution of 11 December 2012 on completing the Digital Single Market (2012/2030(INI)), at http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P7-TA-2012-0468&language=EN, and European Parliament resolution of 4 July 2013 on completing the digital single market (2013/2655(RSP)), at http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P7-TA-2013-0327&language=EN.

in 2013, which called for the completion of the Digital Single Market by 2015.[298] In addition, several studies conducted for the IMCO Committee of the European Parliament are relevant.[299]

Many of the regulatory issues discussed above and in Chapter 5 are raised in the Commission's DSM Strategy of May 2015.[300] The stated aims of the strategy are laudable and include:

- delivering better access for consumers and businesses to online goods and services across Europe;
- creating the right conditions for digital networks and services to flourish; and
- maximising the growth potential of the European Digital Economy

The Commission's communication also contains a roadmap listing a number of actions, some of which are relevant to the issues highlighted in the present study such as:

- Planned legislative proposals for simple and effective *cross-border contract rules* for consumers and businesses by 2015.
- The opening of a competition sector inquiry into e-commerce, relating to the online trade of goods and *online provision of services.*
- An analysis in 2015 of the *role of platforms in the market,* including any relationship to *illegal content.*
- Legislative proposals by 2016 to *reduce the administrative burden arising from different VAT regimes.*
- Reviews scheduled for 2016 of the *current regulatory framework for electronic communications* (including the *e-Privacy Directive*) and the *Audiovisual Media Services Directive (AVMSD).*
- Initiatives scheduled for 2016 on *data ownership, free flow of data* (e.g. between cloud providers and on a European cloud), as well as the *establishment of a Cybersecurity public-private-partnership.*

6.4.2. The views of the European Council [301]

In June 2015, the European Council issued conclusions concerning the Commission's DSM Strategy[302]. In this context, they agreed that action must be taken on key components of the Commission's communication, which included:

[298] European Council, 25 October 2013, EUCO 169/13. The Council reemphasised the importance of the Digital Single Market in its conclusions of June 2014, 18 December 2014, and 25-26 October 2015.

[299] See Patrice MULLER, Siôn JONES and Laura KOCH (2015), "Single Market Regulation", study prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, Policy Department A, at http://www.europarl.europa.eu/RegData/etudes/STUD/2015/563442/IPOL_STUD(2015)563442_EN.pdf; Felix Scheibe, "Building Blocks of the Ubiquitous Digital Single Market (2015)", Proceedings of a workshop prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, at http://www.europarl.europa.eu/RegData/etudes/STUD/2015/518772/IPOL_STU(2015)518772_EN.pdf; and Alberto Bolognini and Elettra Legovini, "Roadmap to the DSM: Prioritising Necessary Legislative Responses to Opportunities and Barriers to e-Commerce", study prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, Policy Department A, at http://www.europarl.europa.eu/RegData/etudes/note/join/2012/492434/IPOL-IMCO_NT(2012)492434_EN.pdf.

[300] European Commission (2015), COM (2015) 192 final.

[301] See http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/index_en.htm.

[302] European Council Conclusions of 25-26 June 2015.

- Removing the remaining barriers to the free circulation of goods and services sold online and tackling unjustified discrimination on the grounds of geographic location;
- Guarantee the portability and facilitate cross-border access to online material protected by copyright, while ensuring a high level of protection of IPR and taking into account cultural diversity, and help creative industries to thrive in a digital context;
- Ensure effective investment instruments and improve the innovation climate, targeting in particular SMEs and startups;
- Identify and deliver rapidly on the key ICT standardisation priorities;
- Ensure the free flow of data;
- Assess the role of online platforms and intermediaries.

6.4.3. Initial input from the European Parliament

In September 2015, the rapporteur for the European Parliament's ITRE and IMCO committees released a draft report "Towards a Digital Single Market Act"[303] which broadly welcomed the Commission's communication, but called for it to be further developed in a number of ways. The draft report is under consideration at the time of writing, and will be subject to amendment. It inter alia suggests:

- cross-border harmonisation of the legal framework *governing online sales*, the enforcement of the Services Directive, and consideration of a *trustmark* scheme;
- avoiding undue regulatory burdens in view of the positive contribution of OTT services to demand for services and to competition;
- the enforcement of the *Telecoms Single Market (TSM)* legislative package, in particular with regard to roaming surcharges and network neutrality;
- *access to platforms* and *barriers to the emergence and scale-up of online platforms; and*
- *Big Data* and rules on the *use, access to and ownership of data and the facilitation of switching between data service providers* to prevent lock-in.

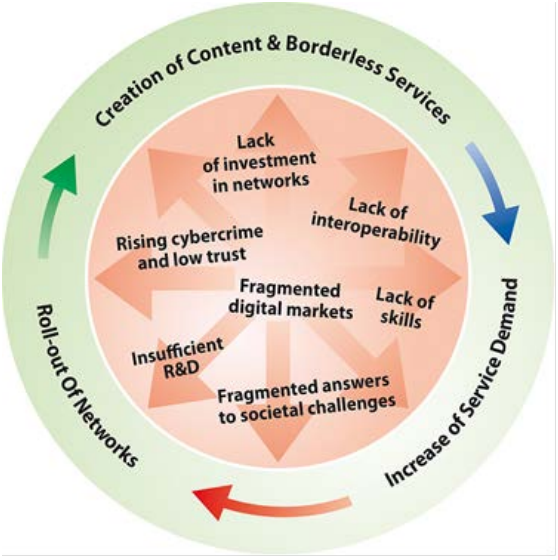
The draft report underlined the opportunities for EU entrepreneurs and businesses of the digital single market. It emphasizes the need to further boost entrepreneurial culture and the interconnection of innovation hubs in Europe. Following a debate in Committee, the report is scheduled to be finalised in early 2016.

6.4.4. Our view

The Commission's DSM Strategy generally covers the right issues; however, an overarching comment is that many of these issues are not new, but were raised in the context of the Commission's Digital Agenda for Europe of 2010[304] The DAE inter alia highlighted the need for a Digital Single Market in which regulatory barriers are eliminated in order to enable commercial and cultural content and services flow across borders, and included actions aimed at "simplifying copyright clearance, management and licensing", and "updating the EU's data protection regulatory framework by the end of 2010". The figure below highlights some of the DAE's main principles.

[303] Draft report: Towards a Digital Single Market Act (2015/2147(INI)).
[304] Digital Agenda for Europe Key Initiatives http://europa.eu/rapid/press-release_MEMO-10-200_en.htm.

Figure 24 : The 2010 DAE challenges – a sense of déjà vu ?



Source: Commission DAE (2010)

A further concern is that the key 'milestones' listed in the DSM Strategy concern legislative initiatives and investigations to be conducted within the coming two years, and it thus far provides limited concrete details as regards the specific changes that will be made to achieve its goals or of the outcomes by which results can be measured – and by when. Is it too focused on the 'means' as opposed to the 'ends'? Given the lengthy timeframes involved in legislation, one could also ask – when will it deliver?

Details will no doubt be forthcoming, but as several of the suggested initiatives involve legislative change, this could take considerable time to take effect. By way of reference, the TSM Regulation[305], which was limited in scope in comparison to much of the proposed forthcoming legislation, took two years from proposal to approval, and requires further implementing initiatives to become effective (for example, the elimination of roaming surcharges is not envisaged until 2017). As previously noted, substantial delays were also experienced in national implementation of the non-discrimination provisions of the Services Directive.[306]

As regards the specific measures, there are a number of areas where we believe more ambition is warranted to achieve a truly single market.

- **A common streamlined regime for data protection, security and law enforcement processes.** Fragmentation and uncertainty in this field are consistently raised by both customers and network operators as factors which undermine the expansion and use of online services. The current and prospective system involves sectoral as well as horizontal measures, with the prospect of further measures through the Network and Information Security (NIS) Directive to come.
- **Consumer protection measures.** Although the Commission proposes to allow sellers to rely on *country of origin* rules and to improve cross-border enforcement, there is a case to be made that in an increasingly global online

[305] See http://ec.europa.eu/digital-agenda/en/connected-continent-single-telecom-market-growth-jobs.
[306] A Commission paper in 2012 found that non-discrimination provisions had not been extensively enforced at national level. See: http://ec.europa.eu/internal_market/services/docs/services-dir/implementation/report/SWD_2012_146_en.pdf.

sales environment, EU-level alignment and enforcement may be beneficial. A strong and unified horizontal consumer protection framework might also allow some of the existing sectoral consumer protection rules to be rolled back.

- The statements on **copyright and geo-blocking** are broadly correct, noting that there are tensions amongst objectives. The DSM strategy provides no indication, however, as to how these tensions will be resolved, and moreover does not clearly address the linkages to audiovisual media policy. The broadband objectives of the Digital Agenda for Europe (DAE) are unlikely to be achieved in the absence of a coherent and integrated approach to audiovisual media, copyright and geo-blocking.

We broadly support the proposed initiatives to simplify and address anomalies in the VAT system, to investigate the role of online platforms, and to take positive steps to promote data portability and switching for example in the context of cloud services.

At the same time, there are other proposals which require more caution and a thorough cost benefit analysis due to the potential costs and legal risks these could apply on online service providers (including European firms), as well as the challenges these could present for enforcement. These include:

- The suggestion that the principle of 'mere conduit' could be amended to require intermediaries to exercise a duty of care.
- The potential extension of the Audiovisual Media Services Directive (AVMSD) to encompass new services and players that are currently not viewed as audiovisual media service and/or to cover providers that fall outside its current scope.
- Any potential extension of the e-Privacy Directive, which currently covers traditional communications providers, but not OTT services which might be seen as being equivalent.

In general, such changes would need a thorough cost benefit analysis in view of the administrative burdens and legal risks that they might pose to online providers, including European startups. They would also serve to maintain the current system in which sectoral rules overlap with horizontal legislation. In this regard, we would advocate an approach consistent with the principles of Better Regulation[307] in which it is first examined whether existing or adapted horizontal measures might be capable of addressing the concerns identified, potentially in conjunction with coregulatory and self-regulatory measures. The pervasion of digital services across society as a whole lends itself to approaches to services which are horizontal and at least EU-wide if not global, as distinct from the national, sectoral approaches which were developed around often national and distinct traditional industries.

Finally, there are some issues which provide important underpinnings for a DSM but are so far missing at least from this strategy. Mobile connectivity is notably absent as a concrete EU goal, even though it is likely to be essential for the accessibility of online services and the IoT. Business connectivity also receives less attention than it should in view of the role that online services could play in boosting productivity.[308] The linkages between venture capital availability (addressed through the Capital Union initiative) and online scale-ups should also be acknowledged.

[307] European Commission (2015), Better regulation for better results - An EU agenda, COM(2015) 215 final.

[308] See for example WIK (2013) Business communications, economic growth and the Competitive Challenge.

Finding 39. The Commission's DSM Strategy addresses the right issues; however, many of these issues are not new, but were raised in the context of the Digital Agenda for Europe in 2010 and in subsequent Resolutions and Conclusions of the European Parliament and Council. It provides specific targets relating to legislative and non-legislative actions, but with little by way of detail or measurable outcomes. It could therefore be asked whether and when this initiative will deliver concrete results? More specifically, there are a number of areas - including data protection and security, consumer protection and copyright – where we believe more ambition is needed to achieve a streamlined approach across the single market. At the same time, there are other proposals which require more caution and a thorough cost benefit analysis due to the potential costs and legal risks these could apply on online service providers (including European firms). We have particular concerns about suggestions to extend the scope of sectoral measures on audiovisual media services and privacy as well as placing a 'duty of care' on intermediaries. Measures on VAT appear to be positive, while the Strategy lacks reference to an important issue affecting online services – the ubiquitous availability of mobile platforms.

7. RECOMMENDATIONS ON A REGIME FOR EUROPEAN OTTS, ONLINE SERVICES, AND STARTUPS

Drawing on the previous reflections, we make a range of recommendations on a regime for European OTTs, online services, startups and scale-ups.

A summary of our procedural recommendations in tabular form appears at the end of this chapter.

The detailed, numbered findings on which this chapter is based appear throughout this report. A list of findings, together with their associated page numbers, appears at the beginning of the report, along with the list of figures and the list of tables.

7.1. Strengthening the European online/OTT startup and scale-up ecosystem

Many studies over the years have bemoaned the lack of an innovation-friendly culture in Europe.[309] The tools available to the Parliament do not directly address *culture* as such; however, there are aspects of the problem that could be amenable to legislative correction. Key challenges include limited access to risk capital, limited willingness to accept risk, and fragmentation of regulation (especially in the area of data protection).

The lack of risk capital for high technology innovation is an issue for startups, and an even more pronounced issue for "scale-ups",[310] firms that are seeking to reach the next phase of growth.[311] Emerging and existing instruments have sought to address this,[312] but none of them are on point. The Commission's recently published Action Plan on Building a Capital Markets Union could potentially represent a vehicle through which these deficits could be addressed.[313]

Fostering a willingness to accept calculated risks is beyond the reach of the Parliament, but creating institutions to moderate the financial impact of sensible risk-taking is not. Creating greater consistency in bankruptcy rules across the Union might well be helpful.[314]

Additionally, it will be necessary to address regulatory fragmentation, especially in regard to data and content flows, consumer protection, and taxation, as fragmentation is an issue for all online service firms, but especially for startups and scale-ups.

---

[309] See for instance Andre Sapir et al. (2003), An Agenda for a Growing Europe; and Esko Aho et al. (2006), "Creating an Innovative Europe: Report of the Independent Expert Group", at http://ec.europa.eu/invest-in-research/action/2006_ahogroup_en.htm.

[310] According to a study by Octopus and the Centre for Economics and Business, although scale-ups represent "only 1% of the total UK business stock, they generated 36.2% of the UK's economic growth and 68% of total employment growth".

[311] See Karen E. Wilson (2015), How to unleash the financing of high growth firms in Europe, Bruegel, at http://bruegel.org/2015/05/how-to-unleash-the-financing-of-high-growth-firms-in-europe/. "Access to capital is critical for SMEs and start-ups. In particular, growth finance is important for young innovative firms, which are the drivers of growth and jobs in the economy."

[312] Among them are the SMEs aspect of H2020, the Capital Markets Union (CMU), and the European Fund for Strategic Investment (EFSI).

[313] European Commission (2015), Action Plan on Building a Capital Markets Union, COM(2015) 468 final.

[314] See Karen E. Wilson (2015), op. cit. "[P]rogress needs to be made on addressing regulatory fragmentation across Europe in areas such as insolvency law and taxation. In many European countries, there is inadequate scope for companies to declare bankruptcy, which would allow them to restructure or more effectively close their businesses without lasting penalties that prevent future start-ups."

Simplifying the EU VAT regime and addressing anomalies in the third country exemption for low value shipments (LVCR) would benefit European online firms. We have addressed some, although not all, of the relevant questions, in this study.

In order to avoid unintended consequences from policy initiatives in future, one innovation that could be explored for potential inclusion in the Better Regulation Toolkit might be the use of 'policy labs' to test the effect of regulation prior to its application, such as have been introduced in the Netherlands and the UK. [315]

Lastly, it is important to ensure that consumers and business have platforms available to enable them to access online services at all times and in all places. In this context, we would recommend the inclusion of specific targets for mobile and business connectivity within any amended 'Digital Agenda' for Europe.

7.2. Foster cross-border access to digital content (including European works)

As noted in Section 5.7, Europe is subject to numerous deficits in regard to production, distribution, and cross-border consumption of audio-visual content. Europe's cultural and linguistic diversity is in general a strength, but it also implies a substantial degree of fragmentation of our audiovisual media industry.

These deficits have widespread, complex, and interlinked implications. Impediments to the availability to online providers of high quality audiovisual content in the languages that Europeans speak limits consumer choice, limits the desirability of European online services, and negatively impacts consumer interest in ultra-fast broadband (thus also putting Digital Agenda (DAE) for Europe broadband objectives at risk).

Copyright and geo-blocking arrangements are arguably excessive today, but they also represent a key component of the funding model that promotes the creation of audiovisual content. Any reform will need to delicately balance conflicting objectives.

The proposals that the European Commission has put forward in the DSM strategy[316] as regards cross-border services in general, copyright reform, and geo-blocking appear to be directionally appropriate, but far more needs to be done, and the various policy areas need to be better integrated.

As regards the review of the AVMS Directive, there is clearly a challenge in distributing and promoting a diverse and rich range of European works within the EU. However, it is not clear that extending 'obligations' such as those currently in the AVMS Directive to US-based and other players would address the root cause of the problem. An approach based on extending AVMS rules may also be difficult to enforce and may also affect increase burdens on smaller EU-based providers. Alternative solutions should be investigated.

[315] Policy Design labs have been pioneered in the Denmark (Mindlab - http://mind-lab.dk), the UK (Policy Lab and What Works Centres - https://openpolicy.blog.gov.uk/category/policy-lab), and Canada (Inwithforward - http://inwithforward.com). The Govlab (http://thegovlab.org) based at NYU is an international effort focused on policy 'prototyping' and the use of data in open and collaborative policy design. A new Policy Lab initiative in the Netherlands is aimed at co-design and impact assessment of *digital era policies*.

[316] European Commission (2015), "A Digital Single Market Strategy for Europe", COM (2015) 192 final.

7.3. Level the playing field among the Member States (and address OTT/telco anomalies at the same time)

We noted in section 6.1 that addressing 'horizontal' barriers to entry – such as cross-country fragmentation and burdensome rules are key to enabling online service providers aiming to expand in the European Single Market and to compete fairly and effectively with global rivals. Fortuitously, addressing this issue should also address another anomaly in regulation – whereby traditional service providers and OTTs may face different rulesets for ostensibly similar services.

A useful starting point in this respect is definitions. The application of sectoral legislation today is based on definitions, some of which refer to specific delivery and payment mechanisms; however, this may not reflect the way in which consumers see these services. A revision of the definitions currently in use such as that for Electronic Communications Services is likely to be needed in any review of legislation (in electronic communications, media or indeed in other sectors) which affects digital services. In this context, we would recommend that service definitions should reflect consumers' perceptions rather than technological or operational considerations. Thus distinctions between 'managed' and OTT may become irrelevant.

Taking this point a step further, we note that sectoral regulation may prove increasingly difficult to interpret and implement in an increasingly horizontal digitalised society. Therefore, when applying rules to digital services, a preference should be given to horizontal rather than sectoral rules at EU level, in conjunction within self and/or co-regulatory measures, potentially implemented at a global level. One implication may be to redefine the boundary of what is covered within the EU Framework for Electronic Communications, and thereby roll-back its provisions to address primarily (broadband) connectivity, leaving services as far as possible to be governed by horizontal rules. The potential for such a deregulatory step should be carefully considered and costs and benefits assessed.

A further issue concerns the jurisdiction for legislation and enforcement. In an online environment which is increasingly cross-border and even global in scope, and where European companies seek to gain similar scale to those in the US or other large geographic regions, it makes sense to harmonise rules applying to online services and, to the extent possible, to enforce them across a wide geographic area. Therefore, wherever practicable, rules applying to online service providers should (preferably) be fully harmonised at EU level. A European authority or co-ordination body might in some cases be justified. Wherever full harmonisation would not be possible, efforts should be made to pursue the *country of origin* principle.

7.4. Streamline and simplify privacy, data protection and security

The European institutions seek to unify data protection within the Union with a single law, the General Data Protection Regulation (GDPR)[317]. The recent communication on the DSM reiterates the need to address the fragmented market for data. The current EU Data Protection Directive 95/46/EC does not adequately address globalization, or technological developments such as social networks and cloud computing.

A RAND/TNO study for the European Parliament[318] has however expressed concerns that the proposed GDPR restrictions on profiling could negatively impact the

[317] See http://ec.europa.eu/justice/data-protection/.

[318] See Jonathan Cave, H.R. Schindler, Neil Robinson, Veronika Horvath, Sophie Castle-Clarke, A.P.C. Roosendaal, Bas Kotterink (2012), "Data Protection Review: Impact on EU Innovation and

competitiveness of European firms versus those in the US, and might impact small companies more than large with regard to data storage and processing requirements for Big Data applications. The GDPR is needed, but these issues ought to be addressed.

Meanwhile, there is an urgent need to put new arrangements in place to replace the Safe Harbour arrangements that have just been invalidated by the ECJ; however, it is exceedingly difficult to see how this could be achieved in practice.

We further recommend the streamlining and simplification of rules concerning privacy and security in the EU. Consideration should be given to repealing some or all provisions within the e-Privacy Directive if other measures substantially address relevant issues, and ensuring that NIS Directive provisions address security concerns in a manner that is not unduly onerous or impractical for online platforms including startups.

7.5. Clarify competition approach to digital platforms and services

Considerable attention has already been paid to *vertical* aspects of competition, including the tensions between network operators and OTT services provided over broadband connections; however, the perceived competitive challenges presented by online services and in particular online platforms themselves are equally important.

Platforms allow third parties to build new products and services on top of them, which can lower costs and stimulate the emergence of new players; however, platforms also benefit from a *network effect* in which players which gain scale tend to retain their market advantage. These new online winners in the digital ecosystem may create new dependencies and competitive challenges, especially for smaller firms which rely on platforms for advertising and marketing.

Further research into the regulatory environment for platforms and the sharing economy would appear to be warranted. As part of this research, an analysis could be made on the use, effectiveness and efficiency of national provisions to combat unfair business practices, with a view to considering whether such provisions may be useful in the digital environment and whether lessons can be learned at EU level.

A related concern is that customers in the online environment may be locked in to their provider, especially as data moves to the cloud. GDPR provisions concerning data portability might prove to be important for the future competitiveness of digital services, but the balance of costs versus benefits needs to be solidly understood. Commercial standardisation of data formats and of switching processes should be promoted to ensure that solutions are workable both for suppliers and for customers.

7.6. The Commission's Digital Single Market initiative

As noted in the previous section, we believe that the Commission's DSM strategy[319] largely covers the right issues; however, an overarching concern is that it does not include measurable targets reflecting the outcomes of the planned initiatives, while its planned reliance in many cases on legislative change risks lengthy timescales and uncertain outcomes.

It is also useful to take lessons from the past as far as possible regarding the progress made under the DAE, which covered several of the same times. An important

Competitiveness", study prepared for European Parliament´s Committee on Industry, Research and Energy, Policy Department A, at http://www.europarl.europa.eu/RegData/etudes/etudes/join/2012/492463/IPOL-ITRE_ET(2012)492463_EN.pdf.

[319] Ibid.

recommendation could therefore be to include measurable 'output' related targets within the DSM Strategy, akin to certain of the targets included in the DAE, and to put forward concrete means of measurement. We would also recommend that specific consideration is given to whether in any case, faster delivery could be achieved through the implementation of existing legislation, guidelines and/or with the support of self or co-regulatory measures.

7.7. What could be the impact of an effective Digital Single Market?

A London Economics study 'Medium Term Assessment on Reducing Costs and Barriers for Businesses in the single market' that is expected to be released shortly suggests that addressing consumer protection, trust and privacy issues alongside creating the right standards to support cloud computing could benefit Europe by more than €200 billion per year.

7.8. Issues requiring further research

Many of the issues we have addressed require further study. One especially timely initiative is the ongoing review of the EU framework for electronic communications, which raises questions both about the appropriate scope of the revised framework (and potential for deregulation of applications and services) and the relevance and as appropriate achievement of a single market as regards telecommunication services. Another timely initiative would be to investigate the role of online platforms in the digitalised economy.

Concerning the DSM Strategy specifically, we believe that conducting an evaluation of the DAE including initiatives relevant to the DSM, could provide valuable lessons for the future. The Parliament could also play a valuable role in researching what could and should be appropriate and measurable targets for a Digital Single Market, taking account of what could be achieved in Europe and what has been achieved (at least in certain respects) in other jurisdictions such as the US.

Challenge	Recommendations to support online start-ups	Legislative implications
4. Strengthen the European online/OTT startup and scale-up ecosystem		
Limited access to venture capital	• Analyse why measures taken to date have been ineffective. • Speed up existing measures to make venture capital available to high potential (online) startups. • Encourage European Corporates to invest in startups.	Might be addressed in the upcoming Capital Market Union.
Lack of an entrepreneurial culture	• Encourage calculated risk-taking by making bankruptcy laws more forgiving and more consistent across the Member States.	Partly addressed in the upcoming CMU.
Lack of ubiquitous platforms for delivery	• Introduce specific targets for mobile and business connectivity.	Inclusion in successor targets to DAE.
Tax regime creates complexity in EU and inconsistency outside	• Simplify the EU VAT regime. Establish a VAT threshold in order to promote the creation and initial growth of European start-ups, OTTs, and online services. • Address the low value consignments relief (LVCR) exemption for third countries.	Included in the DSM.
Unintended consequences from regulatory reform	• Stress-test the impact of digital regulation before its introduction. Possibly through Policy Labs (new initiatives in the UK and the Netherlands).	Potential inclusion in the Better Regulation Toolkit.
5. Foster cross-border access to digital content (including European works)		
Policy for cross border distribution is disjointed	• The linkages between audiovisual media policy, copyright, and geo-blocking need to be more clearly thought through, more concrete, and more fully elaborated.	More ambition is needed.
Limited distribution of European works	• Consider alternative solutions to promoting European works as opposed to expanding the scope of the AVMS Directive to online services. as this could be burdensome and hard to enforce.	Seek alternative solutions to expanding AVMSD scope.
6. Level the EU level playing field (which will also address any telco/OTT inconsistencies)		
Overlapping sectoral and horizontal rules	• Define services in terms of the way they are viewed by consumers rather than according to the technological or payment mechanisms involved. The 'managed' vs OTT distinction is unhelpful – likewise 'traditional' vs 'digital' • Consider reducing the scope of the EU Framework for electronic communications to connectivity. Review implications thoroughly.	Can be addressed by the review of the regulatory framework for electronic communications (RFEC).
Rules can be	• Research potential for full EU harmonisation and enforcement systems	More ambition is needed on

inconsistent within EU, or burdensome in comparison with other jurisdictions	(including EU bodies) for rules (for instance, consumer protection) applying to online service providers. Where full harmonisation is not feasible, favour rules based on the *country of origin* principle. • Consider self or co-regulatory measures or enforcing legislation before new legislation.	harmonisation, more focus on streamlining legislation.
4.Streamline and simplify privacy, data protection, and security		
Data protection rules are complex, and implementation inconsistent, undermining data flows	• EU privacy and security rules should be streamlined and simplified. • Consider repealing some or all provisions within the sector specific e-Privacy Directive if cross sectoral measures e.g. GDPR can be made to substantially address the relevant issues. • Any change to the "mere conduit" provisions which limit liability for intermediaries should carefully weigh the impact on smaller intermediaries, as well as the practicability of enforcement.	More ambition is needed, with a focus on streamlining.
The rejection of safe harbour has created a legal vacuum	• Put new arrangements in place to replace the Safe Harbour arrangements that have just been invalidated by the ECJ.	A solution is urgently needed, but challenging.
NIS security arrangements are immature	• NIS Directive provisions should address security concerns in a manner that is not unduly onerous or impractical for online and OTT services, including startups and scale-ups.	Can be addressed within the NIS.
5.Clarify competition approach to digital platforms and services		
Emerging concerns over possible dominance of online platforms are being handled in different ways	• Further research into competition policy (and the regulatory environment) for platforms and the sharing economy is warranted. • Analyse the use, effectiveness and efficiency of national provisions to combat unfair business practices. • Competition policy needs to consider more fully (1) the speed with which new disruptive market entry is possible; (2) dynamic effects, including the benefits to consumers of new services; and (3) the complex dynamics of two-sided markets.	Research is called for.
Risk of lock-in, risk of service monopolisation	• GDPR provisions concerning data portability are likely to be important for the future competitiveness of digital services. Commercial standardisation and widespread adoption of standardised data formats as well as switching processes would likely be needed to ensure that solutions are workable for suppliers and customers. A comparison of benefits to costs	Can be addressed within the GDPR. More concrete focus on implementation is needed.

	on implementing solutions is warranted.	

General Recommendations concerning the DSM Strategy	
Milestones reflect 'means' rather than 'ends'	• Create measurable output targets by which the success or otherwise of the DSM Strategy can be assessed.
Need to learn from past to avoid future mistakes	• Conduct thorough evaluation of the DAE with a view to drawing on that experience to improve the implementation of the DSM Strategy.
Reliance on potentially lengthy legislative processes	• Consider whether alternatives exist in each case to legislation – with a focus on potential implementation of existing measures, the use of non-binding guidelines and self and co-regulatory initiatives (where appropriate).

REFERENCES

Adhikari, V.K.; Yang Guo; Fang Hao; Varvello, M.; Hilt, V.; Steiner, M.; Zhi-Li Zhang, "Unreeling netflix: Understanding and improving multi-CDN movie delivery," INFOCOM, 2012 Proceedings IEEE , vol., no., pp.1620,1628, 25-30 March 2012, doi: 10.1109/INFCOM.2012.6195531.

Aho, E. et al. (2006), "Creating an Innovative Europe: Report of the Independent Expert Group", http://ec.europa.eu/invest-in-research/action/2006_ahogroup_en.htm.

Veenstra, A.F. et al. (2013), "Ubiquitous Developments of the Digital Single Market", study prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, Policy Department A, at: http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/507481/IPOL-IMCO_ET(2013)507481_EN.pdf.

AT Kearney: A viable future model for the Internet (2010), at https://www.atkearney.com/documents/10192/4b98dac5-0c99-4439-9292-72bfcd7a6dd1.

Bartlett, G., Miller, C. (2011), 'truth, lies and the internet, a report into young people's digital fluency' , Demos, at https://www.nominettrust.org.uk/sites/default/files/Truth%20-%20web.pdf.

BEREC (2012) Report on differentiation practices and related competition issues in the scope of net neutrality, at http://www.berec.europa.eu/eng/document_register/subject_matter/berec/reports/1094-berec-report-on-differentiation-practices-and-related-competition-issues-in-the-scope-of-net-neutrality.

Bosker, B. (2011), 'As Internet Use Grows, Is it Polarizing Political Views?', Huffington Post, at http://www.huffingtonpost.com/2011/03/29/internet-polarizing-politics_n_842263.html.

Brown, S. (2014), Homekit, Thread bring app dev to the center of Smart Home success, at http://www.wired.com/2014/09/homekit-thread-smart-home.

Burton, G. (2015), Google manipulated its search engine to promote its own services and took content from rivals – report. Available at http://www.computing.co.uk/ctg/news/2400950/google-manipulated-its-search-engine-to-promote-its-own-services-and-took-content-from-rivals-report.

Cafaggi, Fabrizio et al (2014). A comparative analysis of transnational private regulation: legitimacy, quality, effectiveness and enforcement. Scuola Nazionale dell' Amministrazione, Rome, Italy /EUI, June 2014, p. 40.

Christensen, L., A. Colciago, F. Etro and G. Rafert (2013), The Impact of the Data Protection Regulation in the E.U.

Coutu, S., (2014). The Scale-Up report on UK Economic growth. Available at http://www.scaleupreport.org/scaleup-report.pdf. Viewed 2 November 2015.

Crémer, J., Rey, P., Tirole, J. (2000) : Connectivity in the Commercial Internet, in Journal of Industrial Economics, Vol. 48, pp. 433-472.

Elixmann, D., J. Scott Marcus, Christian Wernick, with the support of Cullen International (2008), "The Regulation of Voice over IP (VoIP) in Europe", a study prepared for the European Commission, 19 March 2008, available at: http://ec.europa.eu/information_society/policy/ecomm/doc/library/ext_studies/voip_f_f_master_19mar08_fin_vers.pdf.

European Commission (2015), Press release on Android investigation, at http://europa.eu/rapid/press-release_MEMO-15-4782_en.htm.

European Commission (2015), Antitrust: Commission launches e-commerce sector inquiry, Press release, at http://ec.europa.eu/competition/antitrust/sector_inquiries_e_commerce.html.

European Commission (2015), DG Competition guidelines concerning abusive conduct, at http://ec.europa.eu/competition/antitrust/art82/

European Commission (2015), Public consultation on the regulatory environment for platforms, online intermediaries, data and cloud computing and the collaborative economy. Available at https://ec.europa.eu/digital-agenda/en/news/public-consultation-regulatory-environment-platforms-online-intermediaries-data-and-cloud.

European Commission (2015), Statement of objections to Google. Press release, at http://europa.eu/rapid/press-release_IP-15-4780_en.htm

European Commission (2004), "The Treatment of Voice over IP (VoIP) under the EU Regulatory Framework", 14 June 2004, at: http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=3980.

European Commission (2013), Impact Assessment Report, communication on State Aid for Films and other Audiovisual Works.

European Commission (2015), "A Digital Single Market Strategy for Europe", COM(2015) 192 final, 6 May 2015.

European Commission (2015), "Modernising VAT for cross-border e-commerce: Commission launches public consultation", at http://europa.eu/rapid/press-release_IP-15-5719_en.htm.

European Commission (2015), Better regulation for better results - An EU agenda, COM(2015) 215 final.

European Parliament (2015), End in sight for mobile phone "roaming" fees and unequal internet access, at http://www.europarl.europa.eu/news/en/news-room/content/20151022IPR98802/html/End-in-sight-for-mobile-phone-%E2%80%9Croaming%E2%80%9D-fees-and-unequal-internet-access.

Ernst and Young (2015), Assessment of the application and impact of the VAT exemption for importation of small consignments, Final Report, at http://ec.europa.eu/taxation_customs/resources/documents/common/publications/studies/lvcr-study.pdf.

Esmeijer, J., Bakker, T.P., Ooms, M. & Kotterink, B. (2015). Data-driven innovation in agriculture, Case report for the OECD 'Data-Driven Innovation: Big Data for Growth and Well-Being' study.

Farrell, J., Saloner, G. (1985): Standardization, Compatibility, and Innovation, in the RAND Journal of Economics, Vol. 16, pp. 70-83;

Godel M. et al. (2015), Reducing Costs and Barriers for Businesses in the Single Market, study prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, Policy Department A.

Goel, V. and Somaiyamay (2015) Facebook Begins Testing Instant Articles From News Publishers. Available at: http://www.nytimes.com/2015/05/13/technology/facebook-media-venture-to-include-nbc-buzzfeed-and-new-york-times.html.

Grub, J. (2014) Report finds free-to-play microtransactions make up 79% of U.S. app store revenues. Available via: http://venturebeat.com/2014/02/21/report-finds-free-to-play-microtransactions-make-up-79-of-u-s-app-store-revenues/

Hartmann, M. (2015) Big Data for Big Business? A Taxonomy of Data-driven Business Models used by Start-up Firms. Available via: http://www.cambridgeservicealliance.org/uploads/downloadfiles/2014_March_Data%20Driven%20Business%20Models.pdf

Harold Hotelling (1929): Stability in Competition, The Economic Journal, March 1929, pages 41-57.

Hunckler, M. (2015) Internet of Things: Opportunities for Apple, Startups, and More. Available via: http://www.forbes.com/sites/matthunckler/2015/05/15/internet-of-things-opportunities-for-apple-startups-and-more/

HIS (2014), The Future of Television, EBU Knowledge Exchange 2014, available at http://www3.ebu.ch/calendar/KX14.

Jitsuzumi, T. (2015), "Recent Development of Net Neutrality Conditions in Japan Impact of Fiber Wholesale and Long-term Evolution (LTE)", op. cit.

Katz, M. L., Shapiro, C. (1985): Network Externalities, Competition, and Compatibility, The American Economic Review, Vol. 75, pp. 424-440.

Kommerskollegium (2014). No Transfer, No Trade – the Importance of Cross-Border Data Transfers for Companies Based in Sweden. National Board of Trade, ISBN: 978-91-86575-76-2. Available at http://www.kommers.se/Documents/dokumentarkiv/publikationer/2014/No_Transfer_No_Trade_webb.pdf.

Kotterink, B., Broek, T.A. van den, Zinck Stagno, M.C., Butter, M., Hoeve, M.C., Hofman, W.J. & Zee, F.A. van der (2013). Open platforms for web-based applications and services in Europe, enlarging the stakeholders community. ISBN: 978-92-79-28712-1. Available at http://bookshop.europa.eu/en/open-platforms-for-web-based-applications-and-services-in-europe-enlarging-the-stakeholders-community-pbKK3113537.

Leonard, A. (2013) How Netflix is turning viewers into puppets. Available via: http://www.salon.com/2013/02/01/how_netflix_is_turning_viewers_into_puppets/

Lisbon Council (2012), Wired for Growth and Innovation, Issue 12/2012.

Marcus, J. Scott (2006), “Voice over IP (VoIP) and Access to Emergency Services: A Comparison between the U.S. and the UK”, IEEE Communications Magazine, August 2006, available at http://www.comsoc.org/livepubs/ci1/public/2006/aug/cireg.html.

Marcus, J. Scott (2014), "Network Neutrality Revisited: Challenges and Responses in the EU and in the US", study prepared for European Parliament´s Committee on the Internal Market and Consumer Protection, Policy Department A, at: http://www.europarl.europa.eu/RegData/etudes/STUD/2014/518751/IPOL_STU%282014%29518751_EN.pdf.

Marcus, J. Scott, Dieter Elixmann and Christian Wernick, "Next Generation Networks (NGNs)", study prepared for European Parliament´s Committee on Industry, Research and Energy (ITRE), Policy Department A, at: http://www.europarl.europa.eu/activities/committees/studies/download.do?language=en&file=27911.

Marcus, J. Scott, Francesco Caio, and Gerard Pogorel (2014), ‘Achieving the Objectives of the Digital Agenda for Europe (DAE) in Italy: Prospects and Challenges’, a study on behalf of Prime Minister Enrico Letta, available at: http://www.governo.it/backoffice/allegati/74621-9208.pdf.

Marcus, J. Scott, Ilsa Godlovitch, Pieter Nooren, Dieter Eilxmann and Bram van den Ende with the support of Prof Jonathan Cave (2013): "Entertainment x.0 to boost Broadband Deployment", study prepared for the European Parliament's Committee on Industry, Research and Energy (ITRE), Policy Department A, available at: http://www.europarl.europa.eu/committees/en/imco/studies.html#menuzone.

Marcus, J. Scott, Neil Robinson, Joel Reidenberg, Yves Poullet, Adam Peake, Kenneth Carter, , Lisa Klautzer, Chris Marsden, Florence De Villenfagne, Franck Dumortier, Keisuke Kamimura, et al. (2007), “Comparison of Privacy and Trust Policies in the Area of Electronic Communications”, a study prepared for the European Commission.

Marcus, J. Scott, Stephen Adshead, and Gilles Fontaine, et al. (2011): “Impact Assessment integrating ex ante evaluation requirements in view of the preparation of a proposal for the next MEDIA Programme after 2013”, report for the European Commission.

Marcus, J.S. & Burns, J. (2013) ‘Impact of traffic off-loading and related technological trends on the demand for wireless broadband spectrum’, Study for the European Commission.

Mattiolo, D. (2012) On Orbitz, Mac Users Steered to Pricier Hotels. Available via: http://www.wsj.com/articles/SB10001424052702304458604577488822667325882

Miller, R. (2015) Google announces Brillo, an operating system for the Internet of Things. Available via: http://www.theverge.com/2015/5/28/8677119/google-project-brillo-iot-google-io-2015

Miller, B. and Atkinson, R. (2014), “Raising European Productivity Growth Through ICT”.

OECD (2008). Manual on Business Demography Statistics: High-Growth Enterprises.

OECD (2012), "The Development and Diffusion of Digital Content", OECD Digital Economy Papers, No. 213, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/5k8x6kv51z0n-en

OECD (2014), "Connected Televisions: Convergence and Emerging Business Models", OECD Digital Economy Papers, No. 231, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/5jzb36wjqkvg-en

OECD (2015), Data-Driven Innovation: Big Data for Growth and Well-Being, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264229358-en

OFCOM (2015), The Communications Market Report, available from http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr15/

Patel, N. (2012) Over the top: the new war for TV is just beginning. Available via: http://www.theverge.com/2012/11/12/3633984/future-of-tv-over-the-top

Roberts, S. (2014) Automated content: Can algorithms write your content for you? Available via: http://futurecontent.co/automated-content-can-algorithms-write-your-content/

Robertson, A. and Zelenko, M. (eds.) Voices from a Virtual Past: An oral history of a technology whose time has come again. Available via: http://www.theverge.com/a/virtual-reality/intro

Russon, M. (2014) Mac and Android Users Charged More on Shopping Sites Than iPhone and Windows Users. Available via: http://www.ibtimes.co.uk/look-out-you-might-be-charged-more-if-you-shop-online-using-mac-android-device-1474431

Santayana, G. (1905), Reason in Common Sense, p. 284, volume 1 of The Life of Reason.

Schonfeld, E. (2011) Aplpe’s Digital Newsstand Just Disrupted The Publishing Industry. Available via: https://techchunch.com/2011/02/15/apples-digital-newsstand-just-disrupted-the-publishing-industry

Shanoff, D. (2014) Wearables could make the “glance” a new subatomic unit of news. Available via:

Shontell, A. (2014) Mary Meeker's Stunning 2014 Presentation On The State Of The Web. Slide 96. Available via: http://www.businessinsider.com/mary-meekers-2014-internet-presentation-2014-5?op=1&IR=T&IR=TT

Steiner, C. (2012) Can creativity be automated? Available via: http://www.technologyreview.com/news/428437/can-creativity-be-automated/

TeleGeography, January 2014, Skype traffic continues to thrive, https://www.telegeography.com/products/commsupdate/articles/2014/01/15/skype-traffic-continues-to-thrive/

TNS Opinion and Social (2013), "Special Eurobarometer 396: E-Communications Household Survey", Fieldwork: February - March 2013.

Zuckerman, E. (2014) The Internet's Original Sin. Available via: http://www.theatlantic.com/technology/archive/2014/08/advertising-is-the-internets-original-sin/376041/

ANNEX 1: Key Definitions

Table 6. Definitions

	Definition	Applicable to online services?	Applicable to managed / traditional services?
Electronic Communications Networks (ECN)	***Transmission systems and, where applicable, switching or routing equipment and other resources****, including network elements which are not active,* ***which permit the conveyance of signals*** *by wire, radio, optical, or other electromagnetic means, including satellite networks, fixed (circuit and packet-switched, including Internet) and mobile terrestrial networks… networks used for radio and television broadcasting, and cable television networks, irrespective of the type of information covered.*	Not applicable	Not applicable
Electronic Communications Services (ECS)	*A* ***service normally provided for remuneration which consists wholly or mainly in the conveyance of signals on electronic communications networks****, including telecommunications services and transmission services in networks used for broadcasting, but exclude services providing, or exercising editorial control over, content transmitted using electronic communications networks and services; it does not include information society services, as defined in Article 1 of Directive 98/34/EC, which do not consist wholly or mainly in the conveyance of signals on electronic communications networks.*	Not applicable to pure online services, but may apply to VoIP if services interconnect with managed telephony and/or use numbers from the numbering plan	Applicable to managed voice, SMS

Information Society Services (ISS)[320]	***Any service normally provided for remuneration, at a distance, by electronic means and at the individual request of a recipient of services****... excludes 'point to multi-point transmission' including television broadcasting (including near-video on-demand)… excludes 'voice telephony services or services provided via voice telephony' as these are 'not provided via electronic processing/inventory systems'.*	Applicable	Not applicable
Audiovisual media service	***A service which is under the editorial responsibility of a media service provider and the principal purpose of which is the provision of programmes in order to inform, entertain or educate, to the general public by electronic communications networks****… linear AVMS service means a service provided by a media service provider for simultaneous viewing of programmes on the basis of a programme schedule…* ***non-linear AVMS service provided by a media service provider for the viewing of programmes at the moment chosen by the user and at his individual request on the basis of a catalogue of programmes selected by the media service provider.***	Non-linear AVMS may be relevant for certain online media provision, where the content under management of provider, but not where content is user-generated	Applicable to traditional/ managed broadcast and television on demand services

[320] Article 1(2) Consolidated version http://ec.europa.eu/enterprise/policies/single-market-goods/files/directive98-34/index_en.pdf

ANNEX 2: Obligations and Standards

Table 7. Obligations and standards

Measure	Sectoral legislation (ECS/AVMS)	Information Society Services (ISS)	General horizontal legislation	Examples of standards/Codes of conduct
Financial levies	ECS providers may be required to contribute to the costs of operating the national regulatory authority (for electronic communication) and/or to contribute to any net cost of meeting 'universal service' obligations (for voice and Internet access) Art 12, AD, Art 13 USD	N/A	N/A	N/A
Transparency on pricing, terms and conditions	End-users of ECS have a right to a contract which includes pricing, duration, availability of emergency service access, compensation and dispute resolution details. NRA has powers to require transparency on pricing and quality of service. Article 20-22 USD	Member states must ensure that the service provider makes available its contact details, where it is registered and ensure that references to prices are clear and unambiguous and indicate whether inclusive of tax and delivery costs. MS must ensure transparency concerning the steps for	The Directive on Consumer Rights (2011/83/EC) includes rights for withdrawal of the contract (within 14 days) and obligations for service providers concerning the provision of standard forms and information about this right to withdrawal (articles 6 and 9). There are also obligations requiring the price, total costs and extra	Various initiatives to make information available to EU customers in an accessible, easy to understand way, enable customer choice, promote customer trust in online services through more transparency. Initiatives vary from signage (such as the

		concluding a contract online, accessibility of that contract, and information concerning codes of conduct to which provider adheres Art 5, 10 ECD	fees to be displayed. As concerns digital products, the possibility to withdraw from purchases ends when the downloading or streaming begins, implying that such services are exempted from the 14 day 'cooling off' period. T.	PEGI rating); to opt-out schemes for online (behavioural) advertising (such as Youronlinechoices.eu[321] spearheaded by the (European Interactive Digital Advertising Alliance, EDAA)
Access to emergency services	Providers of ECS for originating calls must provide access to emergency services Article 26 USD	N/A	N/A	
Switching/ portability	Subscribers with services linked to numbering plans can port their telephone number to facilitate switching Article 30 USD. Broadband access switching procedures common at national level	N/A	N/A	The European Cloud Computing Strategy supported by the European Commission – one initiative undertaken together with the European Union Agency for Network and Information Security (ENISA) and other relevant bodies is aimed at developing EU-wide voluntary

[321] http://youronlinechoices.eu/

				certification schemes for technical standards applicable to the cloud.[322]
Interconnection and interoperability	ECN owners have a right and obligation to negotiate interconnection with each other in order to ensure provision and interoperability of ECS throughout the Community Article 4 Access and Interconnection Directive (AID)	N/A	N/A	The Internet and associated services such as e-mail are by definition interoperable. However, such interoperability evolved as a voluntary mechanism.
Security obligations	MS must ensure that ECS providers take measures to manage security risks and minimise the impact of security incidents. ECS providers must notify a security breach to national authority – which may in turn inform ENISA Article 13a FWD. E-privacy Directive (article 4) requires ECS providers to inform subscribers concerning security	N/A	Article 13 of the DPD requires data controllers to take appropriate technical and organizational measures to protect personal data. Technical measures include security measures, such as encryption and separation of databases	The European Cloud Computing Strategy supported by the European Commission – one initiative undertaken together with the European Union Agency for Network and Information Security (ENISA) and other relevant bodies is aimed at developing EU-wide voluntary

[322] http://ec.europa.eu/digital-agenda/en/european-cloud-computing-strategy

	breaches and advise on possible remedies (where risk outside scope of ECS provider), direct market			certification schemes for technical standards applicable to the cloud.[323] Participation in CERTs or CERT/CCs (Computer Emergency Response Teams / Coordination Centres) or CSIRTs (Computer Security Incident Response Teams) Participation in WARPs (Warning, Advice and Reporting Points)
Privacy and data retention obligations	Requirements to ensure confidentiality of data (except subject to lawful interception), erase/anonymise data following use, use of data for marketing must be subject to consent, ECS must infom user about data processing, use of location data must be	Unsolicited e-mails to consumers only in case of prior consent. Article 13 (e-privacy Directive). Disguising sender prohibited Member states shall not impose a general obligation on ISS	General data protection requirements based on the DPD. include the need for legitimate grounds for the processing of personal data, and data minimization. Data subjects have to be informed about their data being processed.	The Online Behavioural Advertising initiative – a pan-European initiative of The European Interactive Digital Advertising Alliance (EDAA) The GSMA Mobile Privacy Principles & Design guidelines for

[323] http://ec.europa.eu/digital-agenda/en/european-cloud-computing-strategy

	anonymised, or otherwise subject to consent	providers to monitor information which they transmit or store. Art 15 ECD		mobile applications the BRC global standard in the field of data protection
Transparency in advertising	Audiovisual commercial communications must be readily recognisable. Editorial independence should not be affected by sponsored programmes Art 9, 10,	Member states must ensure that commercial communications are clearly identifiable and that the beneficiary of the commercial communication is identifiable Article 6, ECD		The Online Behavioural Advertising initiative – a pan-European initiative of The European Interactive Digital Advertising Alliance (EDAA)[324] - includes an icon indicating the use of online behavioural advertising - introduces the EDAA trust seal for which independent certification is required (recognized providers of such certificates include ABC, BPA Worldwide, ePrivacyconsult and TRUSTe)
Public interest/protection	Member states must ensure that AVMS	Member States and the Commission shall		Codes of conduct for

[324] http://www.edaa.eu/edaa-news/self-regulatory-programme-for-online-behavioural-advertising-delivers/

of minors	services do not contain any incitement to hatred; that commercials respect human dignity, do not promote discrimination or encourage behaviour prejudicial to health or safety; that minors are protected from accessing 'on-demand' AVMS which could be harmful Art 6, 9, 12 AVMSD	encourage codes of conduct to foster implementation of requirements of Directive including codes of conduct regarding the protection of minors and human dignity Art 16, ECD		notice and take-down The Better Internet for kids initiative[325] which includes activities such as those suggested by the CEO coalition (2011). Activities are aimed at increasing young persons' safety online re social networks, and mobile use (GSMA plays an important role in the latter). National codes of conduct[326] were developed, all with a voluntary character. In the case of the CEO coalition[327], priority areas to develop self-regulatory measures are: simple and robust reporting tools for users; age-appropriate privacy settings; wider use of content classification; wider availability and use of

[325] http://ec.europa.eu/digital-agenda/en/self-regulation-better-internet-kids
[326] http://www.gsma.com/gsmaeurope/safer-mobile-use/national-measures/
[327] http://ec.europa.eu/digital-agenda/en/self-regulation-better-internet-kids

				parental controls; effective takedown of child sexual abuse material. CEO signatories include Apple, BT, Deutsche Telekom, Facebook, Google, Microsoft, Nintendo, Nokia, Opera Software, Samsung, Vodafone. The Pan European Game Information (PEGI) self-regulation for rating European video game content
Accessibility of content	On-demand AVMS providers should promote production of and access to European works, MS should ensure that broadcasters for not cover on an exclusive basis events of major importance for society Art 13, 14 AVMSD	N/A	N/A	
Enforcement of copyright	ECS subject to 'mere conduit' provisions MS must ensure that	Where ISS provides service that consists in the transmission in a comms network of		Codes of conduct for notice and take-down

	media service providers under their jurisdiction do not transmit cinematographic works outside outside period agreed with rightsholders Art 8 AVMSD	information (eg broadband connectivity, communications) the service provider is not liable for the information transmitted Art 12 ECD		
Jurisdiction	AVMSD requirements must be enforced by Member States on providers 'under their jurisdiction'. Jurisdiction is determined by the location of the head office, location where decisions are taken, or where significant part of workforce involved in AVMS. Equivalent to 'country of origin'	Member states must ensure that the ISS provided by a service provider 'established on its territory' comply. 'Country of origin'	Member States have the obligation to ensure that there are competent bodies at which consumers can exercise their rights on consumer protection. For data protection, this is also the case. In the GDPR, currently, a one-stop-shop mechanism is proposed, which would allow to address a Data Protection Authority in any Member State to exercise rights or to file a complaint.	

CAT: QA-02-15-970-EN-C (paper)
CAT: QA-02-15-970-EN-N (pdf)

DIRECTORATE-GENERAL FOR INTERNAL POLICIES

POLICY DEPARTMENT A
ECONOMIC AND SCIENTIFIC POLICY

Role

Policy departments are research units that provide specialised advice to committees, inter-parliamentary delegations and other parliamentary bodies.

Policy Areas

- Economic and Monetary Affairs
- Employment and Social Affairs
- Environment, Public Health and Food Safety
- Industry, Research and Energy
- Internal Market and Consumer Protection

Documents

Visit the European Parliament website:
http://www.europarl.europa.eu/supporting-analyses

PHOTO CREDIT:
iStockphoto.com; Shutterstock/beboy

ISBN 978-92-823-8488-6 (paper)
ISBN 978-92-823-8487-9 (pdf)

doi: 10.2861/063659 (paper)
doi: 10.2861/706687 (pdf)

Publications Office

Over-the -Top players (OTT)