CREATION OF START-UP AND SPIN-OFF FIRMS IN THE BRATISLAVA REGION

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ABSTRACT

The start-up and spin-off landscape has evolved considerably in Slovakia in recent years. The creation of start-ups is representing important mechanism for new innovations. The creation of university spin-offs enables the commercialization of research as well as it contributes to technology development and economic growth in the region. The corporate spin-offs may result from corporate restructuring or can also result from R&D. The paper gives overview of start-up and spin-off firms in the Bratislava region. The aim of the paper is to identify the start-ups and spin-offs (university and corporate) in the region and to analyse the start-up and spin-off ecosystem in the Bratislava region.

JEL: *O3*

KEYWORDS: *innovation, start-up, university spin-off, corporate spin-off*

INTRODUCTION

Start-ups and spin-offs have received sufficient attention in the literature on new firm formation. Both the creation and the expansion of new firms affect employment and economic growth. The majority of business start-ups are set up by "lifestyle entrepreneurs" whose business will not grow beyond a very small size. With respect to company creation, the EU economy is – compared to the USA – characterized by a lack of entrepreneurial spirit or "entrepreneurial gap". However, the majority of business start-ups are set up by 'lifestyle entrepreneurs' whose businesses will not grow beyond a very small size. It is often the case that a small number of rapidly growing new and young firms contribute disproportionately to the net employment effects. This suggests that it is not only the frequency of entrepreneurial firms that makes the difference for employment generation but also the quality and growth-potential of new firms. What produces this high quality is largely unclear. With respect to company creation, the EU economy is compared to the USA characterized by a lack of entrepreneurial spirit; commonly referred to as the 'entrepreneurial gap.' The data confirms that Europe lags behind when it comes to the creation of high-growth innovative entrepreneurial firms. It suggests once again that Europe lacks both an entrepreneurial spirit and the ability to grow innovative entrepreneurial start-ups into large firms (Dahlstrand, Stevenson, 2010).

Corporate spin-offs are enterprises created through the organizational separation of internal corporate activities into independent enterprises. Corporate spin-offs may result from episodes of major corporate restructuring, where as a result of corporate focus on core competencies, valuable – but non-core – assets outside of the corporate strategic focus are identified and separated into independent firms. Corporate spin-offs can also result from R&D activity, whereby promising technologies are developed, but which again are non-core to the operations. I both cases corporations will provide some resources (organizational, personnel, financial) for the spin-off, but will "outsource" most of the financing and corporate governance to Venture capital organizations (VCOs). For VCOs spin-offs are attractive due to the already mature management teams that spin-offs have, as well as the access to parent-company resources (Piech, Radosevic, 2006).

There has been little research thus far on corporate spin-offs in CEE (Central and Eastern Europe). Iliev (In Piech and Radosevic, 2006) suggests that corporate spin-offs are not a significant source of deal flow for CEE VCOs. As R&D activities conducted by MNEs (Multinational Enterprises) in CEEs are very limited, they are unlikely to generate spin-off

opportunities, while low levels of R&D by domestic corporations make it unlikely that spin-off opportunities are generated and identified. However, it is likely that continued development of domestic corporations in CEEs and increased managerial expertise will lead to an increased number of corporate spin-offs in the future (Piech, Radosevic, 2006).

Higher education institutions (HEI) spin-offs tend to be successful as a technology transfer channel where the technology is still at a very early stage of development, is characterized by very high levels of technology uncertainty, the replication of the technology is dependent on tacit knowledge held by the originating laboratory/researcher. The formation of a spin-off becomes an attractive option, as it provides the innovator with the incentives, resources and time to take the technology to a stage where it is either ready to be sold to other buyers, or can allow the spin-off direct entry on the market. In addition, on equity share or licence free arrangement with the parent HEI ensures that the value from the technology is captured by the institution. While most of the literature in this area has focused on HEI spin-offs as a vehicle for the commercialization of "world-first" technologies, an additional possibility for HEI spin-offs activity is in the context of inward technology transfer, from the international area to the domestic economy (Piech, Radosevic, 2006).

Several studies have discovered a growing start-up and spin-off locations in urban areas, e.g. USA (Silicon Valley, New York), UK (London), Germany (Berlin), etc. (Florida, 2013).

Numerous studies have shown that companies funded by entrepreneurs who have already worked in the same industry perform better than others. These firms are often referred to as "spin-off" or "spin-outs" and they more likely to survive, grow quickly and earn larger profits.

Start-ups and spin-offs are an important part of every successful entrepreneurship ecosystem.

The paper is organized as follows. The first section after introduction highlights the methodology of the paper. The second section examines the main actors of start-ups and spin-offs ecosystem in Bratislava, especially start-up firms and spin of firms (university and corporate). In the third section we analysed the start-up and spin-off ecosystems in the Bratislava region. In the final section we present paper conclusions.

1 METHODOLOGY

The aim of the paper is to identify start-up and spin-off firms (university and corporate) in the Bratislava region and to analyse the start-up and spin-off ecosystem in Bratislava.

The research questions are:

1. What is the industry structure of start-ups and spin-offs in Bratislava region?
2. What are the differences between start-ups and spin-offs creation in the existing ecosystem of Bratislava?

The methodology of the paper is based on the methodology of the finished project "VEGA", where one of the main aims was to analyse the needs of support between the start-up and spin-off firms in Bratislava.

There are various research methods for start-up and spin-off analysis. For example, in order to study how best to support innovative spin-offs and start-ups, the other methodically important survey focused on needs of Slovak start-ups was elaborated by KPMG. The goal was to measure the heartbeat of the Slovak start-up ecosystem and its individual actors and leaders.[1]

First introductory information about the start-up and spin-off community in Bratislava were received during the expert interview at Neulogy. According to the estimation of Neulogy, there is at about 200 start-up and spin-off firms in the Bratislava region.[2]

The qualitative research between start-ups and spin-offs in Bratislava was provided during the period 2014-2015 (in form of online questionnaires with head firm representatives). Qualitative data were collected also from various events for Slovak start-up and spin-off community organized in Bratislava during the period 2014-2015, e.g. MobCon, Startup Awards 2015, SBA Startup Sharks Roadshow 2015, etc. Additional data about the start-up and spin-off ecosystem in Bratislava were received also from already realized research in this field in Slovakia, e.g. KPMG Startup Survey.

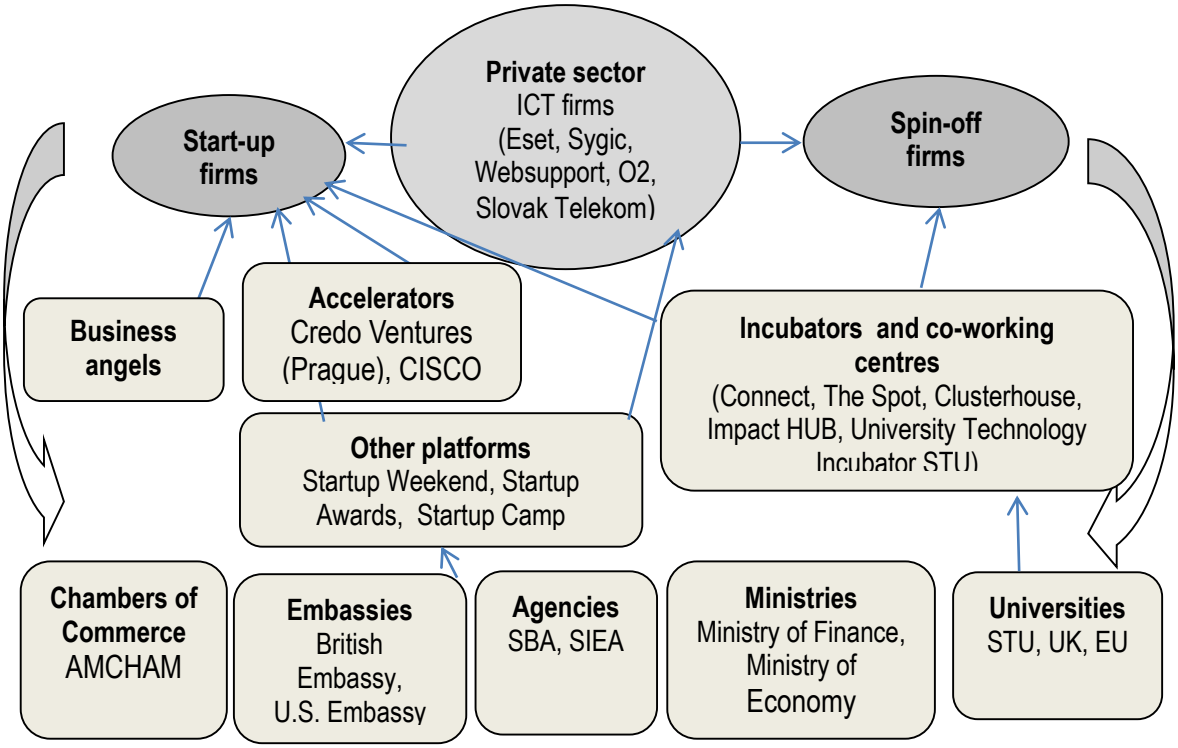
2 THE START-UP AND SPIN-OFF ECOSYSTEM IN THE BRATISLAVA REGION

The Slovak start-up ecosystem has started to develop in 2010-2011 through partial initiatives of public sector. The public sector has started to engage in 2013 through "National Business Centre, with creation of national schemes for start-ups support and in frame of Operation Programmes of EU.[3]

The main actors of start-up and spin-off ecosystem (figure 1) in Bratislava are: start-up and spin-off firms, private sector (ICT firms), universities, business angels, incubators, accelerators, public sector (ministries and agencies) as well as other institutions (chambers of commerce, embassies), etc.

[1] KPMG, Startup Survey Slovakia 2014.
[2] Interview, Neulogy, Bratislava, February 20th 2015.
[3] Startup 4 Dummies, Digitalvisions, 2015.

Figure 1 The start-up and spin-off ecosystem in Bratislava



Source: Own elaboration.

The support environment for start-ups and spin-offs in the Bratislava region is created by business angels. To important business angels in Bratislava belongs G4, 42 Angels, Klub podnikateľských anjelov Slovenska, Neulogy, Michal Truban, Milan Dubec (founder of Azet.sk). The examples of incubators in Bratislava are: The Spot, Young Entrepreneurs, BrainHouse and University Technology Incubator of STU- InQb.[4]

The important accelerators recently active in Bratislava are: Telekom Innovation Contest, Orange Fab, Cisco Entrepreneurs in residence, SAP Startup Focus, IBM Global Entrepreneur, Star Cube, Podnikateľský nápad roka.[5]

In case of further support environment, during the last 4 years in Bratislava were established new creative spaces, e.g. The Spot, Connect Coworking, BrainHouse. The main competitions and initiatives where entrepreneurs and members of start-up and spin-off community in Bratislava can take a part are: Startup Weekend, STARTUP SHARS (Slovak Business Agency), Startup Awards.SK, Startup Camp, Start FIT.[6]

[4] University of Technology Incubator is a department of the Slovak Technical University in Bratislava, which aims its activities to support start-ups. New created firms provide an advantageous lease office space and support services package. Available at: http://www.inqb.sk/en/

[5] IT Ročenka 2014

[6] ORFÁNUS, D. (2014).

From other active support institutions in the start-up and spin-off ecosystem in Bratislava, we can mention foreign chambers of commerce (AMCHAM), foreign embassies (British Embassy), Slovak government agencies (SBA, SIEA), Slovak ministries (Ministry of Finance, Ministry of Economy).

The important roles are playing local universities in Bratislava, e.g. University of Economics (EU), Comenius University (UK) and especially Slovak Technical University (STU), where the mostly university spin-offs were created.

2.1 Start-up firms in the Bratislava region

Bratislava is recently the main Slovak location of many successful and innovative start-ups (table 1). Dominated are especially start-ups in ICT sector, as Slovakia has tradition in this industry, e.g. in software industry (Pástor, Šipikal, Rehák, 2013).

Although in the past we have seen successful Slovak technology firms, e.g. Eset, Sygic, Innovatrics, the number of globally successful start-up firms is still relatively low.

The start-ups in Bratislava are created in various industries, e.g. ICT, biomedicine, genetics, automotive/airline, construction, environment, energy, etc. Looking at the start-up firms created in Bratislava, we can find predomination of firms in the ICT sector, for example we can mention: BigRing Solutions, BeeSafe, Sli.do, Pixel Federation, Datamolino, Vestigen, Tootoot, Waste.it, Websupport, Martinus.sk.

Some of the start-up firms in Bratislava. e.g. Sli.do already outgrown the borders of Slovakia with its product (presentation SW), The Pixel Federation is among the leading firms in the field of gaming industry, significantly increased during the last years The main source of income for this start-up is Facebook now (GAŠPARÍK, 2015).

Datamolino is one of the most successful start-up firms in Bratislava. The focus is on the data processing of invoices and receipts and import into accounting SW. It is separate project with infrastructure in the cloud and is used on the international markets.[7] The start-up Tootoot (Startup Award Winner in the category Digital), has created the application as a marketing tool to promote music concerts.

[7] DATAMOLINO, Available at: https://www.datamolino.com/sk/ [accessed March 1st 2016]

Table 1 Start-up firms in Bratislava

Start-up firm	Year of establishment	Nr. of employees	Industry	Type of product
BigRing Solutions	2010	7	ICT	IT transfer of knowledge
BeeSafe	2015	7	ICT	B2C
Geneton	-	-	Genetics	Analysis of DNA
Sli.do	2012	-	ICT	Presentation SW
Pixel Federation	2007	142	ICT	Development of PC games
Datamolino	2014	-	ICT	Service of cloude archive
Vestigen	2014	-	ICT	Diagnostic model for blood testing
Bioscience	2010	-	Biomedicine	Diagnostic and therapy of oncology and viral ilness
Aeromobil	1990	40	Automotive/ Airline	Sport aeroplane
Min60	2013	1	ICT	Mobile and OSX application
Youstice	2015	25	ICT	Application
TapHome	2012	6	Construction	Regulation of heating system
Tootoot	2014	9	ICT	Application
Waste.it	-	-	ICT	Mobile application
Websupport	2013	45	ICT	Web hosting

Source: Own elaboration based on questionnaire survey 2014-2015, http://hnonline.sk.

The other important sector of start-ups in Bratislava is biomedicine and genetics. The examples of successful start-ups in this sector in Bratislava are: Bioscience, Geneton, Vestigen. Vestigen, is example of innovative start-up with innovative products, which devices serves as home diagnostic centre that allows to monitor the status of human body.

The successful and innovative start-up that is strongly pushing the global markets is Aeromobil. The firm has developed a prototype of flying car. Turning point for firm was invitation to the congress in the United Arab Emirates (UAR) and the exhibition Aero Tech in Montreal. With the completion of prototype 2.5 firm has attracted attention from foreign capital investors, e.g. from UAR (GAŠPARÍK, 2015).

Among other innovative start-up firms in Bratislava, we can mention Nice Architects with development of Ecocapsule. This product represents environment friendly and a unique portable housing, with own generation of electricity.[8]

[8] PŇAČEKOVÁ, A. 2015. In Hospodárske noviny magazín, 2015.

Other start-up Waste.it with its mobile application represents a solution to continuously monitor state of filling containers. In the field of biomedicine, e.g. Bioscience start-up is focused on the diagnosis and treatment of cancer and viral diseases.[9] This field of biomedicine is extremely demanding on capital investment.

2.2 Spin-off firms in the Bratislava region

The corporate spin-offs in Bratislava (table 2) occurred mostly after splitting from the parent company.

Table 2 Spin-off firms in the Bratislava region

Spin-off firm	Year of establishment	Nr. of employees	Industry	Type of spin-off	Type of product
ENFEI	-	-	Electricity	University spin-off	Smart grid
Fossali	-	-	-	Corporate spin-off	-
HYDROTECHNIKA STU	2001	-	Water construction	University spin-off	-
InHiro	2014	6	ICT	Corporate spin-off	Online software for SMEs
IVMA STU	-	-	Nature science	University spin-off	Services
Nicereply	2010	5	ICT	Corporate spin-off	Customer rating system
PixelCut	2012	2	ICT	Corporate spin-off	Application Paint Code for Mac
Runforum	-	-	ICT	Corporate spin-off	Sport&leisure
SMME STU	-	-	Automotive	University spin-off	R&D consulting
Stafino	2014	-	ICT	Corporate spin-off	Aplication for bars, hotels and restaurants evaluation
STIVITAL	2009	-	-	University spin-off	Food&health
Vezma	-	-	ICT	Corporate spin-off	GPS application
Websupport	2013	45	ICT	Corporate spin-off	Web hosting

Source: Own elaboration based on questionnaire survey 2014-2015, STU Bratislava.

[9] Bioscience. 2015. Available at: http://www.bioscience.sk

From successful corporate spin-offs we can mention project of digital book Vezma (spin-off from Sygic). Nicereply (spin-off from Websupport) has developed rating system to the customers reply. In case of InHiro, was created recruiting system through social networks. Runforum is application for running improving. Similar successful spin-offs in Bratislava has thanks to the experience of teams or founders a much more higher chance not only to attract investors but also go ahead on the global market, since they can easily reach the customers (through parent companies of through personal contacts of company leader).

The university spin-offs in Bratislava were created mostly at the Slovak Technical University, e.g. HYDROTECHNIKA STU, IVMA STU, SMME STU, STIVITAL. These university spin-offs are mostly result of R&D activity at the STU in Bratislava, where University Technology Incubator was founded in 2005. Generally the university spin-offs are focused on R&D.[10]

3 ANALYSIS OF START-UP AND SPIN-OFF ECOSYSTEM IN THE BRATISLAVA REGION

For analysis of start-up and spin-off ecosystem we consider 6 components – culture, market, human capital, policy control, financing and support of government institutions.

- Culture

Technical skills by Slovak start-ups are not missing, lacking are trading skills. It is needs to create teams from different cultures, which can fine-tune the product's image and brand to various markets. Teams made up of dozens of nationalities can be commonly found in European capitals, for example in Berlin, London, Barcelona, but also in Prague, Krakow and Budapest. The positive is that even in Bratislava are already formed international team.

- The market

In terms of size Slovakia is for start-ups and spin-offs small market. For start-ups and spin-offs in Bratislava it is in this respect a priority early expansion abroad. Created product must therefore be competitive and globally. Market and customers, is the most common reason why the start-up firm went Slovakia. It is not a mass outflow. Several start-up firms have established their branches or headquarters abroad, especially from its image reasons, e.g. in case of SynopsiTV or M.dot, or most likely in case of Datamoline.[11]

[10] STU, Available at: http://www.stuscientific.sk/content/spin-off-spolocnosti
[11] ORFÁNUS, D. (2014).

- Human capital

Bratislava has sufficient human capital to meet the needs of new start-ups and spin-offs. Surveys in the start-up and spin-off firms in Slovakia (KPMG and others) show that we have a lot of talented people.[12] Human capital is mainly concentrated at the local universities in Bratislava, especially at faculties focused on IT, for example at the STU (Faculty of Informatics and Information Technologies), at the Comenius University (Faculty of Mathematics, Physics and Computer Science) and at the University of Economics in Bratislava (Faculty of Business Informatics).

- Policy control

The public sector in Slovakia has started to engage in start-ups support since 2013, through the project of the National entrepreneurial centers (NPC), the development of national support schemes for start-ups. Start-ups and spin-offs ecosystem is regulated by Ministry of Finance of SR through a new "Concept for support to start-ups and development of start-up ecosystem in the Slovak Republic", approved in August 2015.

- Financing

Start-up firms usually need financial assistance during the starting phase. After the starting phase of financing for seed (seed), continues through the financing of other early stages, changes in the firm (expansion) to the later stages such as. "management/institutional buy outs".[13]

According to the KPMG, 85 % of Slovak start-ups are in the early stage of development, and 41 % in the beta phase (phase occurring after the prototype), 50 % generate revenue, but 83 % of that less than 100 000 euro. The main sources of financing for start-ups are personal savings (74 %), support from family (22 %), 57 % of start-up firms consider to relocate to another country, with 80 % of them due to new markets/customers, 48 % because of access to funding and 32 % due to the tax and legal environment.[14]

Start-up firms in Bratislava have the opportunity to seek financial support from following investors (table 3).

[12] KPMG Startup Survey Slovakia 2014.
[13] Startup 4 Dummies, Digitalvisions, 2015.
[14] KPMG Startup Survey Slovakia 2014.

Table 3 Investors to start-up and spin-off firms in Bratislava (seed and pre-seed phase)

FFF (Family&Friend&Fools)	Family and friends
Business angels	Business leaders mainly from ICT sector: Michal Truban (Websupport), Miroslav Trnka (Eset), Michal Štencl (Sygic), Miroslav Majoroš (Slovak Telekom)
Accelerators	Wayra (Praha), Credo Ventures (Prague), CISCO
Seed VC+VC+corporate VC	Neulogy, Credo Ventures, Google Ventures, Neulogy Ventures, CISCO
Strategic investors	Mainly from ICT firms
Reward Based Crowd Funding	Kick strarter, Indiegogo
Equity Based Crowd Investing	-
Banks	UniCredit Bank, ČSOB, Slovenská sporiteľňa, VÚB banka
EU funds	Jeremie (ERDF)
Competitions	Startup Awards, Startup Weekend, Startup Sharks, Startup Camp, Star FIT
Coworking centres	Connect (Cvernovka)
Programs for start-up support	Social Impact Award Slovensko
Consulting	Neulogy, SBA, SEIA
Media	www.startuper.sk, Hospodárske noviny, TREND, RTVS, TA3
Public sector	Slovak Business Agency, Slovak Ministries - MF SR, MH SR, MŠVVaŠ SR

Source: Own elaboration based on MobCon, 2015.

CONCLUSION

In this paper we have examined start-up and spin-off ecosystem in the regional context. The Slovak start-up and spin-off ecosystem has relatively a short history. Previous surveys (e.g. KPMG) and our questionnaire survey confirmed that start-up and spin-off firms in Bratislava was created across the whole range of sectors, e.g. ICT, automotive, energy, environment. Especially prevalent are technology start-up firms. The promising sectors for further start-up and spin-off creation are particularly biomedicine, green energy, environment, as well as creative industries.

In terms of co-operation between start-up firms in Bratislava, we have recorded co-operation with local universities, especially with the Slovak Technical University and the University of Economics in Bratislava. This cooperation is currently not sufficient. Start-up and spin-off firms in Bratislava considered its key role is intellectual property. In terms of markets they have to more focus on the global markets.

A positive trend is that even in the Bratislava region already exists support ecosystem that helps start-up and spin-off firms. This ecosystem included incubators, coworking centers, business angels, accelerators, incubators and investment funds. Start-up and spin-off community

in Bratislava has significantly internationalized, e.g. through invitations of foreign experts at various events. Notable in this area is the strong involvement of the Slovak President Andrej Kiska, as well as involvement of foreign embassies in Bratislava (e.g. U.S. Embassy and British Embassy).

A successful example of start-up firms in Bratislava are those that have managed to develop innovative product and who have succeeded in global markets abroad, for example Sygic, Pixel Federation, Innovatrics. In terms of market size Slovakia it is too small a market for start-ups and spin-offs in Bratislava. For this reason, it shows the need to expand at an early stage of development of start-up and spin-off (the majority firms in our survey in Bratislava has a geographic focus of their products global, respectively Europe.

In terms of start-ups creation, there are mostly created in the ICT sector. The corporate spin-offs in Bratislava are mostly created from parent company as result of cooperation with other firm (e.g. InHiro, PixelCut). The university spin-offs are mostly result of R&D activity at the STU in Bratislava, where the University Technology Incubator exist since 2005.

The problem with start-up firms in Bratislava is their funding in various stages of development. Start-up firms in Bratislava can receive financial capital either in Europe, e.g. in the UK is strong financial market and financial sector helps start-up firms, respectively in the USA (Silicon Valley), or Asia (China, United Arab Emirates).

In terms of local cooperation, there is low level of cooperation or not regular between start-up firms and local universities in Bratislava (STU, EU, UK). In case of international cooperation, have arise constantly new links between the Slovak start-ups in Bratislava and innovators in Silicon Valley in the USA, respectively we have seen a link between start-up ecosystem in Bratislava and to London in the UK.

Looking to the future promising sectors for the creation of new start-ups and spin-offs in Bratislava there are mainly B2B ICT (IT security), gaming industry (computer games), the creative industries - 3D printing (e.g. Slovakia has a strong tradition in graphics), biomedicine and biotechnology, which are more capital intensive and promising at the same time in connection with the trend of population ageing. Also demanding are environmental - ecological and intelligent solutions for cities (renewable energy), traditional industries - automotive (connectivity of cars), fashion/clothing industry (clothing and technology), food industry and penetration of "new technologies" in traditional industries, as well as transport, healthcare and sport&leisure.

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