

Marketing i Zarządzanie

nr 4 (50) 2017

(Zeszyty Naukowe Uniwersytetu Szczecińskiego,
Problemy Zarządzania, Finansów i Marketingu)

The Problems of Marketing and Management
in the Light of the Challengers
of the Contemporary Market

(Problematyka marketingu i zarządzania
w świetle wyzwań współczesnego rynku)

Szczecin 2017

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ISSN 2450-775X
(ISSN 1640-6818; 1509-0507)

WYDAWNICTWO NAUKOWE UNIWERSYTETU SZCZECIŃSKIEGO

Wydanie I. Ark. wyd. 8,0. Ark. druk. 8,0. Format B5. Nakład 54 egz.

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Introduction

The issues of management and marketing include a wide scope of considerations, which make it possible to discuss them referring both to entities operating on the market and their environment.

The papers published in this issue of the journal concern mainly aspects related to new challenges faced by enterprises and other institutions, including changes in the expectations and needs of customers. The authors indicate new approaches applied to customers, for instance the use of design management and the importance of research relating to a variety of data. The journal also discusses the issue of a tool for assessing the quality of services using the IPA research method and the so-called city language. Some of the papers contain case studies concerning, for example, experiences in creating public-private partnerships with the participation of NGOs or changes in the business model of a producer using ICT.

The authors of the papers represent various academic centers from EU countries, proving both an individual and a multi-threaded approach to the issues discussed. Thanks to this, the presented content can be useful for a wide audience. The diversity of issues as well as the approach to presenting and analyzing them make this issue of the journal an important element of enriching management sciences.

The editors would like to thank all the authors of the papers for making the effort and preparing original scientific papers that enrich knowledge in the field of broadly understood management and marketing.

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Design Management in the Context of Challenges Posed by New Generations of Recipients

JEL codes: M14, A14

Keywords: design management, new generations of recipients, behavioural criterion

Summary. The article proposes a thesis that one of the ways to answer the challenges posed by new generations of recipients C and L is to apply the principles of design management in the practice of the actions of organizations. The study has a theoretical character and will be verified empirically in the future. The article describes the reason of dealing with the issues, the essence of design management as well as the dichotomy of generations of recipients. On the basis of literature analysis, recommendations have been made on how to use the rules of design management in company actions, giving the answer to the needs of new generations. An integral part of the study is the conclusion.

Introduction

The issue of design management is becoming more and more significant. On the one hand, the interest of enterprises in this subject is noticeable as well as the increase in the number of postgraduate studies,¹ in which classes in this field are conducted. Nevertheless, it should be stated in here that they mainly concern

¹ Warsaw University of Technology, SGH Warsaw School of Economics, SWPS University of Social Sciences and Humanities, Institute of Industrial Design, The West Pomeranian Business School.

industrial design management, what is a considerable simplification and narrowing of the issue.

On the other hand, the growth of interest in this subject matter has been dictated by the establishment of new generations of recipients C and L (Dziadkiewicz, Maśloch, 2013, pp. 81–94), at the same time a research gap in this area is noticeable, because previous research concerned the indication of the role of design, meaning the industrial design, in management and introduction of the benefits coming from its implementation as well as presentation of reference groups, for whom designers create communication strategies.

The aim of this article is an attempt to answer the question on how companies, using the methodology of design management, may respond to the need of new generations including C and L. In order to verify the hypothesis, a literature study has been conducted.

The main conclusion of the research is that the application of the design management technique in enterprises, which allows for creation of modern products with innovative functions, with the implementation of new technologies and good design, is the answer to the needs expressed by Generations C and L.

Generations of recipients

21st century has seen significant changes of civilization. Finding oneself in new reality is a challenge both for consumers and enterprises. We live in this turbulent environment, where processes of changes are obvious, economic crises are frequent, and the society is more and more aware of unlimited possibilities, among others, through access to information. In such a situation we need to prepare ourselves not only from the technological side, but above all from the mental one.

A departure point is a fact that needs and behaviours of the newly identified generations are completely different from the previous ones. Generation, which was managed in a predictable way, is vanishing.

Former research on consumer generations and employees would accept the moment of birth as a criterion. It has been indicated as follows (Kopertyńska, 2012, p. 299):

- Baby Boomers Generation, born 1946–1964,
- Generation X, born 1965–1980,
- Generation Y, also known as Millennials or Echo Boomers, born 1981–1994.

Kopertyńska (2012, p. 299) explained, however, that the division into individual generations is conventional and ambiguous. She claims that the differences between the proposed periods are small and come to about 5 years.

People from Generation Y actively use technology, and thanks to globalization and Internet connection have contacts all around the world. They live longer with their parents and delay becoming adults. However, this makes it possible for them to allow themselves for personal development and their own needs, as opposed to the peers who have loans and families to support. The quality of life and life experiences become more important for them than possessions. Thus, they tend to surround themselves with beautiful items, they travel, test, experience and become open to new trends and cultures. Steady job for a longer period of time is not as important for them as for the older generations that frequently used to work in one, two companies through all their lives. Generation Y is tolerant and open to innovation, but also disloyal towards their work, offered products and anything stable. They treat supervisors as equal employees, only with wider competencies. Therefore, when thinking about promotion or higher earnings they invest in their personal development (Dziadkiewicz, Maśloch, 2013, p. 94).

There are plenty of people, who despite the fact that they should be qualified as Baby Boomers or Generation X, act, dress and spend their free time like Generation Y. While research indicates that mental gap between Gen Y and people born earlier is enormous, not only in terms of mentality, way of work, perception of reality, but also in terms of self-perception, the sense of their own achievements and further self-realization (Plink, 2009, p. 2). On account of this, it seems that currently the age criterion is not an objective factor that truly explains peoples' behaviours: employees and customers. Thus, a better criterion of verification may be the behavioural factor.

Today's recipients and users, Generations C and L, differ considerably from previous generations. The dichotomy between the generations of recipients as well as entrepreneurs is noticeable. They have completely new preferences and behaviours when compared to Baby Boomers, Gen Y, and Gen X, to whom the theory concerning them has already been well established (Dziadkiewicz, Maśloch, 2013, pp. 93-97). In case of research on new generations, there appears a new field, the behavioural criterion, as earlier research distinguished generations according to their age.

Taking into account the behavioural criterion, it is more common to talk about Generation C – young or middle-aged people, who are characterized by intense usage of mobile and Internet connectivity. These are the people who are constantly connected to the Internet on their laptops or smartphones. They use information content at work, school and home. They want to be in touch with their friends all the time, creating social communities, with whom they cooperate and co-create content. Their main indicator is change and constant communications. This is the generation of so-called digital natives who do not know the world without computers, Internet and mobile phones. They move around both

the virtual world and reality equally efficiently (Pickett, 2017; Dziadkiewicz, Maśloch, 2013, p. 94).

Generation L is another attempt to characterize new customers, employees and recipients of marketing communication. These are the people born just before the millennium. This generation meets all the characteristics of the described above Generation C, but it places an emphasis on particular, specific features of behaviour and mentality that do not exist in the previous groups. The name of the generation comes from the first letters of the words that characterize this group. Firstly, it describes them as lazy people. These are the people characterized by passive activity limited to clicking “Like” on Facebook and at the same time supporting charity campaigns, events and other actions through their computer screens. Another feature is the “link”. Generation L has got used to using web pages, on which instead of content there are only links to further web pages. They use social media, i.e. Twitter, Facebook and others, adding there links to the content they have found earlier. To the next features characterizing Generation L there should be added a penchant for short information, news (so called leads). Moreover, Generation L shares information on their private and professional lives with other users of the Internet. The last feature of Generation L worth highlighting is the usage of geolocation services (local) – through smartphone applications (Hatałska, 2013).

Design Management

The term design management can be described from various perspectives. Through years this idea has evolved, changed its meaning and context (Erichsen, Christensen, 2013, p. 107). It is particularly visible when analysing the relation between terms – design and management (Bonaccorsi, 2008).

At the beginning, it should be described what the design management is. Gorb, in his article, defines it as management of industrial design “the effective deployment by line managers of the design resources available to an organization in the pursuance of its corporate objectives” (Gorb, 1990, p. 68). Therefore, he suggests that determining the meaning of this term concerns the role of industrial design in the development of an enterprise, and influences the solution of significant management problems. It also concerns the preparation which is needed by managers in order to effectively use the design. However, the definition only refers to industrial design, which currently is too much of a simplification.

According to Erichsen and Christensen the definition has been transformed into a uniform term understood as “design management” (Erichsen, Christensen, 2013, p. 109). It is a simplification of this issue and a limitation to a merely narrow scope.

Whereas Hollins describes this phenomenon as “the organisation of the process for developing new products and services” (Hollins, 2002). The limitation of the definition only to developing new products is also too narrow approach.

Ramaswamy and Gouillart state that design management is one of the management concepts whose operationalization occurs through implementation of methodology in an enterprise or project teams, together with auxiliary methods and techniques (Ramaswamy, Gouillart, 2010, p. 109).

As visible in the above review, there are plenty of definitions of this notion. However, the term is still ambiguous and changes depending on the author, place of publication, area in which it appears. It depends on such factors as context of the usage or qualifications of the people using this term, it is differently understood in an academic environment, among professional designers (Miller, Moultrie, 2013, p. 161), industry, public and government institutions (Best, 2009, p. 12).

For further research in the field, the author chose one definition, on account of its universality and completeness. Design management is an effective management of people, projects, processes and procedures during designing everyday products, services, surroundings and experiences. It is a comprehensive approach towards an enterprise both from the side of design and industrial design, as well as management – including marketing, finances, strategic planning and operational activities (Best, 2009, p. 12; Best, 2010, p. 8; McBride, 2007, p. 18), thus it is a management technique.

Challenges of new generations

Currently generations of consumers are characterized by “nanosecond culture”, they do not have time for anything and stay in a constant rush. They are exerting bigger and bigger pressure on market environment and they contribute to the evolution in plenty of the economic sectors. Thus, it is well-known that the keynote of 20th century enterprises – “to meet the needs of customers” has no correlation with Generations C and L. Enterprises, offering their products and services to this group of people, have to actively change their business model, adapting it to the reality changing at a dizzying pace. It is the only way to avoid exclusion from the market (Dziadkiewicz, Maśloch, 2013, p. 97). In case of these groups one of the answers to their needs may be the offers proposed by enterprises applying design management in their action methods.

Therefore, the changes include the way of providing services, the attempt towards the customer during negotiations and sales, the marketing rules and the way of communication. Thus, new innovative enterprises have such a huge advantage over companies still cultivating stiff rules of management, which depend on the knowledge from the “pre-Internet” era.

Those enterprises, which are aware of the challenges resulting from the differences between the needs of the former Gen X and current Gen Y, Gen C or L, know that the only way to succeed is the change of the attitude towards management (Dziadkiewicz, Maśloch, 2013, p. 100). This is why there is a demand for benefits resulting from the implementation of the new concept that is the design management.

Conclusions

Looking at the generations in the classic way, in other words on account of the moment of birth, Generation Y is the most interesting one for enterprises. It results from the fact that this is the generation that postpones becoming adult, allows itself for personal development and its own needs, as opposed to the peers who have loans and families to support. The quality of life and life experiences become more important for them than possessions. Thus, they tend to surround themselves with beautiful items, they travel, test, experience and become open to new trends and cultures, which means that they are active and dynamic buyers.

On the other hand, from the behavioural criterion, there are Generations C and L.

Generation C is characterized by intensive usage of mobile and Internet connectivity, usage of information content, creating communities, and their main indicator is change.

Generation L meets all the characteristics of described Generation C. Moreover, it is characterized by passive activity limited to clicking “Like” and sharing information on their private and professional lives with other users of the Internet as well as using geolocation services.

Enterprises that want to avail themselves of the opportunities, resulting from the needs of described generations, should apply design management in their activities. It may mean a bigger chance of product sales. It results from the fact that products created in accordance with design management are well designed and made, which means they are sustainable, they fulfil new – innovative functions, they are being created by multidisciplinary teams that take into account various aspects of their future usage. These products are characterized by new and good design, they follow trends, and they answer customers’ needs. Most of the time these are unique items when compared to other products (cf. Caban-Piaskowska, 2016). Moreover, enterprises manufacturing for those consumers have to be in a constant contact with them, involve them in their projects and creation of new products. Such enterprises, thanks to the application of the design management technique, adapt to the changing surroundings and transform their organizational structures to more efficient and effective performance.

Plenty of companies with a global reputation, including Kraft, Samsung or Procter & Gamble, owe their success precisely to the implementation of the design management (Ramaswamy, Gouillart, 2010, p. 109).

The article has a theoretical character and is just a proposal of the model (point of view) that has to be verified empirically. The author's assumption is to create a complete research that will present the functioning of design management in the context of answering the needs of new Generations C and L from the behavioural standpoint.

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***Design management* w kontekście wyzwań stawianych przez nowe pokolenia odbiorców**

Słowa kluczowe: design management, nowe pokolenia użytkowników, kryterium behawioralne

Streszczenie: W artykule postawiono tezę, że jednym ze sposobów odpowiedzi na wyzwanie stawiane przez nowe pokolenia użytkowników C i L jest zastosowanie zasad design management w praktyce działania organizacji. Opracowanie ma charakter teoretyczny i będzie w przyszłości weryfikowane empirycznie. Wyjaśniono w nim przyczynę zajęcia się problematyką, istotę *design management* oraz dychotomię pokoleń odbiorców. Na podstawie analizy literatury sformułowano zalecenia, w jaki sposób można wykorzystać zasady *design management* w działaniach przedsiębiorstw, odpowiadając na potrzeby nowych pokoleń. Częścią integralną artykułu są konkluzje zawierające rekomendacje.

Citation

Caban-Piaskowska, K. (2017). Design Management in the Context of Challenges Posed by New Generations of Recipients. *Marketing i Zarządzanie*, 4 (50), 7–14. DOI: 10.18276/pzfm.2017.50-01.

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Role of Marketing Research in Acquiring Knowledge for Data-Driven Management

JEL codes: O32, M31, M37

Keywords: marketing research, knowledge management, data-driven decision making

Summary. Knowledge accumulated on the basis of information is currently perceived as a strategic source of organisation and its acquiring becomes an indispensable process and a challenge for modern enterprises. The article attempts to bring closer the concept of data-driven management and answer a question how marketing research, by realizing its fundamental functions, can help in this area. In the course of conducted literature studies the analysis presented how enterprises should fulfill information needs and support data-driven decision making processes through marketing research.

Introduction

Today, the enormous amount of information is a global phenomenon that affects all market participants around the world. The continuous collecting and processing large amounts of data become a daily reality in business. Most organisations, regardless of their size, business profile and financial resources, take actions in the area of obtaining data necessary in a decision-making process. Information becomes fundamental for business operations, and data processing is often the easiest (and the cheapest) way of solving management problems (Płoszajski, 2013, p. 5). Combining data from multiple sources allows to improve

decision-making and management processes, and helps enterprises predict more accurately customer needs and personalize the offer, which leads to improving the quality of services provided (Wójcik, 2016, pp. 64–65).

Acquisition and interpretation of data is of key importance for enterprises, especially in the field of management, where available and valuable data mean more accurate decisions and a risk reduction. Appropriate use of data allows organisations to grow faster, increase revenues, reduce costs and provide products more efficiently. Against this background, the purpose of the study was to indicate the role of marketing research in providing knowledge for enterprises.

Role of Information in Business

One of the fundamental managerial skills is efficient functioning in market realities. To do it successfully it is necessary to recognize and forecast both long-term tendencies, development trends and current changes observed in the market. What also seems indispensable here is an ability to make appropriate strategic, tactical and operational decisions. In order to accomplish various tasks it is vital to systematically collect, select and verify information about market and its players.

Information in organisation performs a number of functions and the most rudimentary include (Bolesta-Kukułka, 2003, p. 75):

- cognitive function,
- motivating function,
- coordinating function,
- managing – controlling function.

A specific function of information concerns a decision-making process in organizations. Information that is topical, precise, accurate and reliable helps to optimize decision-making and thus, enhances the improvement of results and commercial performance. Lack of adequate information implies a risk of making a wrong and, very often, fatal decision whose consequences can be disastrous. Regardless of the type of sector in which an enterprise operates, the prerequisite for efficient decision-making is having precise information and its proper usage (Hague, 2006, p. 14).

It can be assumed that information is indispensable at every stage of a decision-making process. The initial phase is an identification of a problem, determination of its character and working out alternative solutions through their assessment from a perspective of expected results, up to the moment of decision implementation and the assessment of the results. Marketing problems generally include (Churchill, 2002, p. 24):

- problems related to planning,
- problems related to making marketing decisions,
- problems related to controlling decision making functions.

Taking into consideration a cognitive dimension of information apart from a decision-making dimension, a separate category of a “problem” can be distinguished i.e. enhancement of marketing knowledge by helping in its comprehension (Kędzior, Karcz, 2007, p. 20).

Proportionally to listed marketing problems one can distinguish an instrumental or conceptual use of information by managers (Bartosik-Purgat, Mruk, Schroeder, 2012, pp. 14–15, 32–45). In case of problems strictly connected with decisions information is used in an instrumental way, which means it is used directly to solve a current marketing problem. Then, information can help to make both short and long-term decisions related to elements of marketing mix, e.g. which product design is to be implemented, what price it should have, where and by whom products are to be sold or what combination of media should be used in a promotion campaign.

Similarly, instrumental approach is applied in case of control when information is used e.g. to assess the level of customer satisfaction, to determine organization image in a target market or a total market share as well as to assess the impact of adjustments introduced in the past to the set of marketing means. Instrumental approach concerns also using information in the context of planning e.g. to determine actual market opportunities, trends in markets of products, to forecast changes in market infrastructure or to plan a product.

It must be noted that information does not have to be used exclusively to solve current marketing problems or long-term problems, but it can be collected to obtain a better picture of conditions for running business activity. The example of obtaining information in the context of market knowledge enhancement, getting a general picture or enhancement of managerial knowledge can include the assessment of competition in the market, identification of customers’ needs or the assessment of macroeconomic factors conditioning running business activity, such as legal and political conditions, economic trends or social values. In the context of marketing knowledge enhancement one can mention a conceptual way of using information.

Regardless of the type of marketing problems observed in enterprises and the ways of using information, what proves indispensable is a constant collection and processing of economic information in order to support decision-making processes in an enterprise.

Data-Driven Decision Management

These days instinct is no longer enough if a company wants to remain competitive. From a management perspective, making decisions based on data is the only way to win. Data-informed decision making and the culture change inherent therein is a disruptive action, displacing prior norms (Bladt, Filbin, 2014). Most

organizations realize that data should lie at the heart of an organization's decision making, whether they are huge multinationals or small family-run operations. They are moving away from acting solely on hunches and instinct and acquiring data that would improve decision-making process. A data-driven organization stands to gain several advantages, such as remaining competitive forward-thinking companies, more customer focused and enjoying a deeper insight into the customer. Data-driven companies become more agile and able to respond to markets better, to innovate and detect new, or missed opportunities, helping company grow and improve regularly (Roth, 2017).

Data-driven decision management is an approach to business governance that values decisions which can be backed up with verifiable data. The success of the data-driven approach is reliant upon the quality of the data gathered and the effectiveness of its analysis and interpretation (Rouse, 2016). Data can provide insights that help entrepreneurs answer key business questions and lead to insights, which business owners and managers can turn into decisions and actions that improve their business (Marr, 2016). In the view of research carried out by Brynjolfsson, Hitt and Kim on the business practices and information technology investments of 179 large publicly traded firms, enterprises that emphasize decision making based on data and business analytics show higher performance. The key finding of the survey was that firms that adopt data-driven decision making approach have output and productivity 5–6% higher than what would be expected given their other investments and information technology usage. Furthermore, the relationship between data-driven decision making and performance also appears in other performance measures such as asset utilization, return on equity and market value (Brynjolfsson, Hitt, Kim, 2011).

Data-driven decision making exists at the intersection of data quality and decision quality, where quality data supports quality business decisions. Although business insight is most often envisioned as the strategic and tactical decision made from the mountain top of executive management, business insight also comes from base camps where operational decisions are being made at all levels of the organization on a daily basis (Harris 2013, p. 1). Data-driven decision making refers to the practice of basing decisions on the analysis of data rather than purely on intuition. It is not all-or-nothing practice, and different firms engage this conception to greater or lesser degrees. Different industries have adopted data-driven decision making at different rates. The finance and telecommunications industries were early adopters, next automated decision making changed the banking and consumer-credit industries. In the 1990s, banks and telecommunications companies implemented massive-scale systems for managing data-driven fraud control decisions. As retail systems were increasingly computerized, merchandising decisions were automated. Currently we are seeing a revolution in advertising largely due to a huge increase in the amount of time consumers spend online and due to

the ability to make split-second advertising decisions online (Provost, Fawcett, 2013, pp. 53–54).

Looking at the process for applying data to decision making, enterprises should start with strategy. They ought to work out what their business is looking to achieve and identify, which business areas are most important to achieve the overall strategy. For most businesses, the customer, finance and operations areas are key ones to look at. Starting with strategy helps entrepreneurs to ignore the hype surrounding data and not to get lost in a flood of information (Marr, 2016). Having identified strategic objectives, managers can work out what they exactly need to know, and focus on the data that are really needed and that should be accessed or acquired. The first question a data-driven organization asks itself is not “What do we think?” but “What do we know?” (McAfee, Brynjolfsson, 2012, p. 8). It is important to identify internal data and information that has earlier been collected and is available in organization, before setting up the processes and people who will gather and manage needed data.

In the view of informational gap entrepreneurs may buy access to an analysis-ready data set, or collect data through marketing research. Then, to extract meaningful and useful business insights, collected data need to be analyzed. The insights gained from data should be presented to the right people at the right time in order to inform decision making and improve performance. Nowadays there are available various ways to present data as well as helpful tools. Business managers can customize dashboards to display the data they want to see and run custom reports right away. Those changes – in how data can be mined and visualized – allow managers to be able to work with analytics tools and make data-driven decisions. Decision makers would outright turn data into action, transforming the business for the better (Marr, 2016).

Knowledge as the Quintessential Effect of Marketing Research

One of the ways to obtain precise data needful for a data-driven decision making is conducting market research. The enterprises, in the course of market development and with the increase of competition, have increasingly bigger expectations and information needs. The objectives for the achievement of which marketing research is conducted are related to the definition of research itself. They can include solving marketing problems (Green, Tull, Albaum, 1985, p. 2), support in making marketing decisions in enterprises through limiting the range of subjective presumptions of making a decision as well as marketing management dependence on impartial and precise assumptions (i.e. results of research conducted according to strictly defined methodological rules) (Grzegorzcyk, 2002, p. 11). Another objective is also providing help for management in understanding the environment, identification of potential problems and favorable situations

and thus ensuring development and help in running effective actions in individual markets (Kaczmarczyk, 2002, p. 15). The major part of definition emphasizes a decision making aspect, viewing marketing research as a “systematic process of collecting information, its processing, analysis and presentation for the needs of making decisions in an enterprise” (Hajduk, Karaś, Szostek, 2008, pp. 21–24). In the context of indicated functions marketing research has primarily two objectives: to reduce uncertainty in decision-making processes and while planning marketing activities, and then control conducted projects.

The way of using information obtained as a result of research can be viewed as a criterion for a division of marketing research, namely, research conducted in order to solve marketing problems related to planning, research conducted to support current marketing decisions as well as research conducted to gather information that will help to understand a market reality and thus enables to enhance widely understood marketing knowledge, although this knowledge is not acquired in order to solve specific marketing problems.

Regardless of divisions or accepted typology, marketing research, while generating information about company environment, provides presumptions for enterprise marketing management and, in a wider context, broadens knowledge of managers. Organization of processes of acquiring knowledge, ways of its distribution and effective use are today a key element of management. The knowledge currently becomes one of the main resources of organization, which is essential for its functioning and development. The role the knowledge plays in an aspect of enterprise management is extremely vital due to the fact that its resources:

- are the source of creating values and achievement of competitive advantage,
- provide managers with answers to questions concerning objectives and direction of enterprise activity,
- enable current management of enterprise and shape its future
- condition the efficiency of channels of communication and thus, making pertinent decisions and the increase of organisation effectiveness,
- are the basis for developing innovative processes in organization
- enable to set up key business processes
- support development of key competencies of competitiveness (Kaczmarek, Walczak, 2009, pp. 13–17).

The knowledge, apart from other effects of marketing research is one of the most valuable advantages achieved by an enterprise as a result of research. The primary effects of marketing research include raw data that is transformed into information in the course of its processing as well as analysis processes (Duliniec, 2002, pp. 13–15). Data and information included in the report are a direct effect of research, whereas, the other one is knowledge generated by information. So, the knowledge has a supreme position in relation to data and information that are its

basis (Grudzewski, Hejduk, 2004, p. 73). Knowledge can be defined as a source of useful information containing also general values, experiences and rules which enable their interpretation (Kozmiński, 2005, p. 94). Knowledge means also understanding the importance and usefulness of currently acquired information, which is reflected in its application in practice. Factors of creating knowledge are also people, so building knowledge is conditioned by collected information as well as their skills, analytical predispositions and abilities for learning (Kaczmarek, Walczak, 2009, pp. 51–54).

It must be stressed that knowledge is to give answers for specific questions, to solve specific problems and to enhance the achievement of a specific objective or task. So knowledge is reflected in a practical use of collected information and crucial for a given problem. Results and conclusions from the marketing research by enhancing marketing knowledge of managers contribute to making pertinent marketing data-driven decisions. These decisions should then bring specific results. So, an effect of appropriate use of information and knowledge acquired in the course of marketing research is the situation when an enterprise can achieve striking results of market actions, which brings ultimate benefits and is a gratuity for efforts and costs related to realization of research processes.

Conclusions

Knowledge collected on the basis of information is nowadays perceived as a strategic resource of an organization and data-driven management is a key factor of gaining a competitive advantage and in a further perspective, the survival of enterprise. Acquiring data that would improve decision-making process becomes an indispensable process and a challenge for modern enterprises and marketing research, through the realization of its basic functions, can be really helpful in this area. Research enables to gain resources of knowledge indispensable for making decisions, preparing plans, control and a better understanding of the environment and observed changes. Information obtained from a marketing research has not only a decision making function but also a cognitive one, broadening knowledge about phenomena and processes observed in a market. The enterprises should notice this value and try to build knowledge resources indispensable in the context of support of management processes on the basis of data collected in the research. This process generates information about a company environment and provides presumptions for marketing enterprise management and, in a broad sense, the knowledge of managers.

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Rola badań marketingowych w pozyskiwaniu wiedzy na użytek zarządzania opartego na danych

Słowa kluczowe: badania marketingowe, zarządzanie wiedzą, podejmowanie decyzji, dane

Streszczenie. Wiedza powstająca na bazie informacji jest obecnie postrzegana jako strategiczny zasób organizacji, a jej pozyskiwanie staje się nieodzownym procesem oraz wyzwaniem dla współczesnych przedsiębiorstw. W artykule starano się przybliżyć koncepcję zarządzania opartego na danych i odpowiedzieć na pytanie, w jaki sposób badania marketingowe przez realizację swoich podstawowych funkcji mogą stanowić pomoc w tym zakresie. W trakcie przeprowadzonych studiów literaturowych przeanalizowano, jak przedsiębiorstwa zaspokajają potrzeby informacyjne, wspierając procesy decyzyjne bazując na danych oraz jakie miejsce w tym procesie zajmują badania marketingowe.

Citation

Kalińska-Kula, M. (2017). Role of Marketing Research in Acquiring Knowledge for Data-Driven Management. *Marketing i Zarządzanie*, 4 (50), 15–23. DOI: 10.18276/pzfm.2017.50-02.

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The Urban Language (*Urbslingua*) – Phenomenological Method

JEL codes: A13, B4, D7, D04, O3, A1

Keywords: phenomenology, culture map, urban language, morphosign, method

Summary. This manuscript proposes a concept of an urban language, *urbslingua*, embedded in the *urban studies*. It is a tool with the use which one can identify spatial phenomena in need of research, and which helps to place the fragment of space under study in the holistic picture of the city. The city has been treated as a spatial message, the urban space being a multilayered spatial text; the text is written with morphosigns. A morphosign (language equivalent for a grapheme) is an indivisible structural element of the urbanized space. Morphosigns emergent from the urban form (defined by ISUF) denote designates of all types of human activities the spatial reflections of which are situated within the confines of the urban space. The urban space is their synthesis and binder. Morphosigns are bound together by culture which is a navigator of urban spatial order, i.e. a syntax.

Introduction

The city focuses its attention of numerous scientific disciplines. As those disciplines develop to become more specialised and internally diversified, and narrower and more specialised study areas merge to form interdisciplinary fields, the city becomes their object of study as well (in urban sociology; history of building cities; urban planning; urban geography; urban economy; etc.). Depending on the approach favoured by an individual researcher, studies aimed at developing

theoretical constructs or working out practical solutions can be problem-oriented (holistic) or centred on a single aspect (partial). The multiple complexity of the urban space, however, always requires an interdisciplinary approach, whereby individual studied aspects are viewed in a holistic context.

This text proposes a concept of an urban language, *urbslingua*, embedded in the *urban studies*. It is a tool with the use of which one can identify spatial phenomena in need of research, and which helps to place the fragment of space under study in the holistic picture of the city.

The city has been treated as a spatial message, the urban space being a multilayered spatial text. The text is written with morphosigns. A morphosign which is a language equivalent for a grapheme is an indivisible structural element of the urbanized space. Morphosigns emergent from the urban form (defined by *International Seminar on Urban Form*, ISUF, 2017) denote designates of all types of human activities the spatial reflections of which are situated within the confines of the urban space; the urban space is their synthesis and binder. Morphosigns are bound together by culture which is a navigator of urban spatial order, i.e. a syntax.

Culture is understood in terms of Edward Hall's communication theory of culture as a *silent language*. An individual, while functioning within a defined territory, transforms his/her activities into culture by shaping those activities in the way he/she thinks fit and are in agreement with local environmental conditions. In the urban language, the universal human needs are systematised into Primary Message Systems (PMS); they correspond with the culture map as their matrix. The PMS or types of human activities, pervading one another, form the substance of culture and have their spatial designates.

A hypothetical city

A human settlement is a form of socio-spatial organization. Its substance is conditioned and shaped by diverse factors operating under different circumstances. The human settlement itself (a city as well as conditions and factors modelling the city), change in time and space, and are determined by a culture of the city builder represents. The city builder is a human being and institutions he/she establishes (the family, a market operator representing state and private sectors, a community, a local group, a city itself). This suggests that the individual first transforms the space according to principles and canons of his/her own culture and grants it a certain shape, status, and function in the process; then, the individual behaves and acts according to the laws of the space he/she appropriated by using it and building within it.

The city and the village, a pair of human settlements, are not abstract constructs. These are names of certain locations where people live permanently or just visit, or they denote sites of origin of something or of accumulation of something.

They are types of settlements humans create to adapt a fragment of the available space to fit their needs and to confer spatial characters upon it, to *make the space comfortable to be in*.

Each human settlement, regardless of a historical period, features buildings, streets, squares, roads, sidewalks, greenery, utilities, and means of transportation. It hosts diverse institutions functioning as school, post office, police, surgery, hospital, management office, place for interment of the deceased, eatery, hotel, factory, and exchange and purchase-sale site. Spatial distribution of inhabitants and institutions creates the socio-topography. Spatial systems and cubic elements constructed above- or underground have their own physiognomic characters resulting from materials used for construction and finishing and from the architectural style. The resultant structure is embedded in the local relief, with a due consideration to the local conditions: geology (determining the type of fundamentals required), climate (determining the structure of walls, wall openings, roofs, stability of the materials used, and the architectural style), characteristics and demography of the local community. The inhabitants, attending to their needs, move in the streets and perform actions resulting from routine practices.¹ They visit sites, institutions, buildings. Signs direct people to relevant institutions. The street gallery² displays graphic, light and written messages. Some have authors while others are anonymous. Interpersonal relations in the public space convey a lot of information about the place in question. The place has its own dialect. A human settlement emits diverse sounds. Each time of the day and night has its own sound. The sound brings information about the time of the day in the city (or in the village). Sounds of conversations carried out by passers-by, of vehicles, and of birds differ in intensity depending on the time of the day. In addition, the content of the sound brings important information as well, e.g. about the *street language* being used. The place has its smells, emanating mostly from rooms and buildings, but also evidencing the type and quality of vehicles (means of transportation in general), sanitary standards, personal hygiene products and perfumes used. The human settlement

¹ Routine practices, a concept adopted from A. Giddens, correspond to a human being's dietary habits, clothing, behavioural patterns, or frequenting in favourite places. These are attributes of a lifestyle defined as a more or less integrated system of practices a human being adheres to not only because they are useful, but also because they provide a material shape to individual identity narratives. In this way, according to A. Giddens, the Weberian *Strände* (i.e. life's chances) have become a lifestyle as understood in a conventional way, that is as a concept covering the spheres of consumption and work habits (Giddens, 2002, pp. 112–122).

² The street gallery stems from the word *gallery* which has a number of meanings. In architecture, a gallery is among others an elongated external or internal space on upper floors of a building, extending along the length of the wall; a gallery may be a collection of objects or characteristic items displaying peculiar properties (*Galeria*, 2017). The street gallery denotes a space created in the city streets, surrounded by building façades, and filled with a collection of different objects and characteristic items displaying peculiar features [see footnote 13 in Pirveli 2008, p. 57].

has also its colours. These depend on climatic conditions, vegetation, colours of the façades, advertisements, night- and daytime lighting, and the colour of human skin and clothing. Each person present in a founded reality expresses their attitude towards the surroundings. All people decide on the climate (atmosphere) of the place. All that taken together forms a profile of the founded reality in a fragment of the urban space. This is a hypothetical founded reality modelled by a social grouping (community Figure 1).

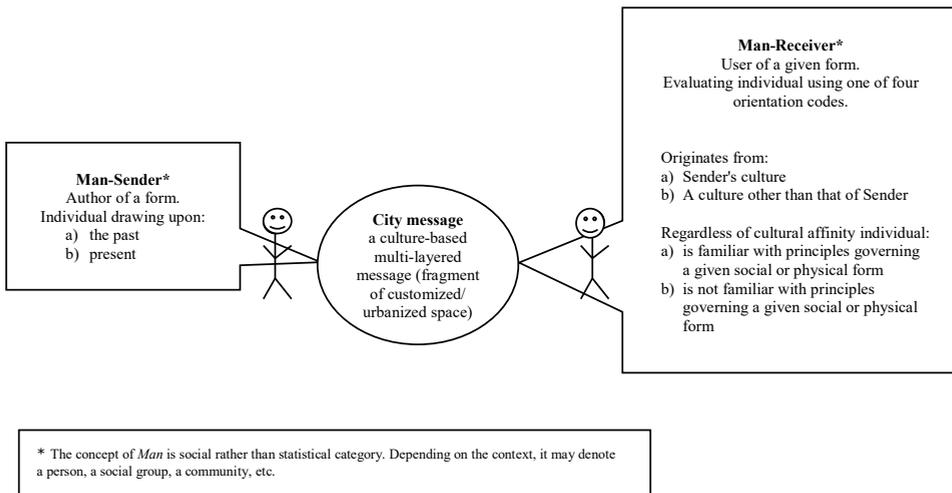


Figure 1. Man-Sender and Man-Receiver

Source: Pirveli, 2008, p. 137.

In a case study, the hypothetical city described above and shown in Figure 1 ceases to be an abstract concept, since it is translated into concrete messages left by a community of active and acting human beings. When we describe particular cases of customized places, the hypothetical founded reality becomes filled with content, and the physical space takes on non-spatial value (Wallis, 2001); it becomes memorable and identifies the site. After some time, the hitherto-existing designates human activity, a substance of social facts, generate a new context. That context lies at the foot of and models all the subsequent processes. Anyone who comes in any contact with the customized space, comes into contact with evidence of activity of another human being who, consciously or unconsciously, acts according to the dictates of his/her “own” culture.

Communication theory of culture

According to the Communication Theory of Culture, culture evolves from pre-culture. It consists of biological activities of an individual which serve to satisfy the universal human needs (sleep, movement, communication, mating, learning, defence, feeding, recreation, playing, construction of tools with the use of which it is possible to broaden the scope of one's senses). A human being functioning within a territory has transformed his/her own biological activities (i.e. pre-culture) into culture by shaping them into a most convenient form, compatible with local environmental conditions (Hall, 1987, pp. 184–185).

E. Hall operationalized culture and systematized its substances based on its best-known component: the language. While setting off from the anthropological definition of culture³ he developed its sociological definition stating that “culture is communication and communication is culture” (Hall, 1987, p.184). As a result, he juxtaposed the categories of “language” and “culture”. E. Hall identified ten Primary Message Systems (PMS. Hall, 1987, p. 48). As a result, he perceived culture as a system the substance of which is formed by the interlacing PMS.

PMS, a notion taken from the communication theory of culture based on linguistic communication models, is a specialized form of interaction. Interaction is a movement; in a multitude of ways, it is related to human existence. A human dwelling place is a site where activities associated with human existence are concentrated. A list of PMS is a system of ten mutually intergrading constants. Their matrix is the map of culture (Table 1). An active human being gives the PMS an appropriate form; thus, the PMS constitute the substance of culture, but they also affect the sites of human activities (Figure 1).

Map of culture – matrix of human activities

The map of culture is a matrix which systematizes human activities, reflected in the (hypothetical) city (Hall, 1987, p. 200). Table 1 shows types of human activities emerging from different combinations of interacting PMS. The PMS are listed in the left-hand column of Table 1, with each one being given a short explanation below its name. The upper row of the table shows relational (attributable) PMS equivalents; these indicate more concrete spheres and aspects of the interrelationships between human activities. For example: writing, communication, telephones, etc. form a communicational scope of PMS interactions, while exchange is the economic “orbit” of PMS interactions. The recreational scope of PMS interactions is the active or passive participation in arts and sports. This is

³ For anthropologists, culture is long enough as a way of life of some communities, the sum of learned patterns of behaviour, attitudes, tangible objects (Hall, 1987, p. 43).

Table 1
Map of culture by Edward Hall

		RELATIONAL EQUIVALENT OF PMS (scope)								
PMS (expressed in three aspects: formal, technical, and informal)	0. INTERACTIVE (everything that emerges within individual PMS as a result of contacts and communication)	1. ORGANIZA- TIONAL (organizational aspects of individ- ual PMS)	2. ECONOMIC (economic aspects of individual PMS)	3. GENDER (gender expres- sion within individual PMS)	4. SPATIAL (social and spatial range and sites of expression of individual PMS)	5. TEMPORAL (perception of time in individual PMS)	6. EDUCA- TIONAL (educational aspects of individ- ual PMS)	7. RECREA- TIONAL (recreational aspects of individ- ual PMS)	8. DEFENSIVE (defensive aspects of individual PMS)	9. EXPLOITA- TIONAL (exploitational aspects of individ- ual PMS)
1	2	3	4	5	6	7	8	9	10	11
0. INTERACTION (each type of contact, i.e. communication)	00. Communication, voice qualifica- tors, gestures, language	01. Status and role	02. Exchange	03. Principles of inter-sexual interactions	04. Interaction sites	05. Time of inter- action	06. Teaching and learning	07. Active and pas- sive participation in art and sports	08. To defend and to be defended	09. Use of writing, means of communication, telephones, etc.
1. COMMUNITY (techniques, criteria and forms of social organization)	10. Community	11. Society, class, caste, govern- ment	12. Economic roles	13. Gender-based roles	14. Role of local groups	15. Age group role	16. Teachers and students	17. Recreation animators and athletes	18. Defenders: doctors, clergy, soldiers, police- men	19. Scope of utilis- ation of a game's properties
2. TYPES OF BREAD-WIN- NING (kinds of jobs providing a source of income)	20. Ecological community	21. Occupational groups	22. Labour: jobs, occupations, types of support	23. Gender-based division of labour	24. Sites of cooking, eating, etc.	25. Time of cooking, eating, etc.	26. Learning by working	27. Work-related employment	28. Health and life protection	29. Management of food, resources and equipment
3. SEXUALITY (each type of relations and way of gender expression)	30. Gender-based community (clan, affinity)	31. Marital groups	32. Family	33. Gender opposi- tion in biology and technology	34. Areas assigned to individuals according to gender	35. Periods assigned to individuals according to gender	36. Gender roles in education	37. Gender versus participation in recreation	38. Gender and ferti- lity protection	39. Gender iden- tification with ornaments and decorations
4. SPACE (a territory)	40. Area-based community	41. Area occupied by a group	42. Economy branches	43. Male and female areas	44. Formal and informal space, boundaries	45. Temporal division of space	46. Site assigned to an individual for learning	47. Spatial categories of games and play	48. Privacy	49. Use of fences and signs
5. TIME (subjective perception of physical time)	50. Commu- nity-specific temporal cycles	51. Group's temporal cycles	52. Economic cycles	53. Temporal cycles of activity of men and women	54. Space-defined temporal cycles	55. Temporal sequences, calendars	56. Time when an individual is learning	57. Time of entertain- ment	58. Leisure, vacation, holidays	59. Use of chrono- metres

1	2	3	4	5	6	7	8	9	10	11
6. EDUCATION (life-long process of learning; all the remaining PMS are shaped by education process)	60. Knowledge, subject matter being taught	61. Educational groups and institutions	62. Remuneration for teaching and learning	63. Content matter taught to men and women	64. Teaching sites	65. Temporal extension of teaching	66. Acculturation, informal teaching, education	67. Education as an entertainment	68. Self-defence and personal health care	69. Use of auxiliary training techniques
7. PLAY (forms and ways of relax and organization of recreational space)	70. Plays, games, art, sports	71. Play groups	72. Sports and recreation as professions	73. Gender-based games	74. Recreation sites	75. Season-related games	76. Educational games	77. Recreation, laughter, games, play	78. Exercises	79. Use of recreational objects
8. DEFENCE (everything an individual defends himself/herself from)	80. Defence – structured defensive systems	81. Defence groups: armies, police, public health, religious organizations	82. Economic patterns of defence	83. Objects defended by a gender (home, honour, etc.)	84. Defended sites	85. Time of defence	86. Scientific, religious, military training	87. Group games, war games	88. Formal, informal, technical defence	89. Use of defence materials
9. EXPLOITATION (everything that is used to make the remaining PMS practically applicable; area, processes and techniques making it possible to broaden the range of Man's senses)	90. Communication network	91. Organization network (cities, building complexes)	92. Food, resources, technical infrastructure	93. Gender-based interests and properties	94. Property (enclosed, enumerated, measured)	95. Periods being measured and recorded	96. School facilities and educational aids	97. Show and sports business	98. Fortification, armament, medical equipment, protective devices	99. Technology, interaction with environment, exercise habits

Legend:

Cells:

- on the diagonal: cross section of each PMS with its relational equivalent,
- above the diagonal: pertinent to individual,
- beneath the diagonal: pertinent to group.

Table part:

- upper left: formal actions (i.e. those making up everyday existence of an individual);
- central: informal actions (i.e. those showing individual's own style of behaviour);
- bottom right: technical actions (i.e. those set by science and law, learned by education in a broad sense).

Information recorded in a cell:

- entry: name of an activity complex (may be rendered more detailed in the cross-section);
- number: a numeral assigned to a category; a sub-category, with a sub-number, is formed by itemization of major category.

Source: Piveli, 2008, p. 154.

reflected in functional-spatial structures and in the occupational make up of local communities as well as in leisure-related activities.

The cells in the diagonal (from the upper left-hand corner to the lower right-hand corner of the table) are formed at the intersection of each PMS with its relational equivalent. The cells above the diagonal pertain to an individual, whereas those beneath the diagonal concern a group. For example: recreation is provided to a group by singers and athletes who are organized into music bands, sports teams, and theatre ensembles.

The upper left-hand part of the table shows formal activities (i.e. those which make up day-to-day existence of a human); the middle part summarises informal activities (i.e. those expressing individual's behaviours); the entire lower right-hand part is devoted to technical activities (i.e. those which are prescribed by science and law, and are learned through education in a broad sense – not limited to schools only). Each category is separate. However, related activities have been placed in adjacent cells.

The map of culture consists of one hundred numbered major cells. Each entry in a cell represents a complex activity. Each activity may be itemised and broken down into endless number of components. Each numeral, however, is permanently associated with a major sphere of human activities: 0, Interaction; 1, Association; 2, Subsistence; 3, Sexuality; 4, Territoriality; 5, Temporality; 6, Learning; 7, Play; 8, Defence; 9, Exploitation. Each of one hundred categories can be easily divided by 10, and each of the emergent sub-categories can be further divided by 10, hence we have: 80 – structured defence systems (social defence); 80, 2 – economic aspects of social defence; 80, 5 – its temporal aspects, etc. The final result is a multi-layered table, as each entry placed in a cell under a particular number may be expanded vertically (not horizontally).

The system has a theoretical basis in the form of a finite list of Primary Message Systems and human activities as derivatives of their interactions. The entire matrix is written with contentless entries, which provides the map of culture with a universal character. Information accumulated in the numbered entries of the map renders different cultures comparable, while empirical models focused on culture are often not able to attain such comparability. Descriptions of material equivalents of PMS bring the hypothetical city to life (Figure 1).

Material aspects of PMS

The map of culture is a *sui generis* cultural equivalent of the multiplication table or of the periodic table of elements. It serves as a basis for the essence of any culture, including the city. Each culture creates its own town, because the town is

a spatial reflection of human needs, i.e. it is a place where their material aspects are concentrated⁴.

Each Primary Message System (PMS) has its own material aspect on the basis of which one may see its physical form. The material aspect – for example – of gender differences is a difference in clothes, the material aspect of labour being represented by tools. The time and the space are measured with instruments. Play is materially represented by toys, books representing education; even social position has its own material representation (socio-topography). Thus a scientist concerned with studies on human settlements can derive cultural parameters from studying spatial designates of interacting PMS. Table 2 presents a more detailed, albeit incomplete, description of material aspects of PMS from the standpoint of the place of their concentration (Figure 1).

Table 2

Selected material aspects of PMS

<p>Each society and community has its own management system. Culture creates a material aspect of food (a PMS) by deciding:</p> <ul style="list-style-type: none"> – what a human being eats and when, – how the food is prepared and what the eating place looks like, – what vocabulary is used at the table and in food-related advertisements, – human behaviour during meal preparation and consumption (customs), – special customs typical of different jobs and occupations, – evaluation of jobs in the sphere of alimentary patterns (adapted to local patterns of social organization), – institutionalized principles of labour safety which frequently decide on the appearance of a site and clothing of food industry personnel, – process of food processing and meal preparation in public and private spaces, – interior decoration and size of a kitchen, a dining room, a cellar (describes both cultural features of a site and its users and determines the image of the city in the visitors' consciousness). <p>Eating culture (here: in the city) reflects distant fields such as specialised:</p> <ul style="list-style-type: none"> – constructions, – interior decoration, – range and selection of food products sold wholesale and in smaller quantities, – methods of foodstuff sorting, – kinds and features of household appliances, – production cycle directly related to both food production and equipment necessary in food production, processing and consumption. <p>Eating culture is reflected in the urban spatial space as:</p> <ul style="list-style-type: none"> – spatial-functional structure of facilities directly related to food, sanitary requirements, opening hours, – kinds of household appliances and food and the sites of purchase thereof, – kinds of services rendered by food industry, – arrangement, size, interior decoration of spaces used for eating in public and private buildings,

⁴ An exception is a typical politicized city, e.g. a city typical of soc-realistic urban planning. In the politicized city, human needs reflect urban forms, as the form is superimposed by ideology; thus ideology, by creating needs, attempts to take the place of culture (Pirveli, 2000, pp. 17–25).

Continuation of Table 2

- purpose and hours of frequenting different eateries,
- way of cooking and serving dishes,
- clothes, appearance and behaviour of individuals in direct contact with consumers and those who do not have such contact,
- interior decoration of and furniture in spaces used for food preparation and consumption,
- conversations, music and the atmosphere accompanying consumption as well as the etiquette of consumption,
- smells and cooking shows, etc.

Gender differences are related to physiology. Behaviour of representatives of one sex towards the others of the same sex and those representing the other gender has its origins in culture canons and determined atmosphere of the city. In each culture, different genders have their own respective behaviour patterns. Cultural sex attributes include:

- clothes,
- ornaments,
- appearance,
- hair style,
- cosmetics,
- scents,
- gestures,
- tone of the voice,
- social function,
- household and workplace duties,
- activities,
- course of proceedings
- sites off limits to one sex (a saloon, a harem, a bath, a locker room, a toilet)
- places of between-gender meeting (places to have a date or a walk, bedroom, etc.)
- games,
- competitions,
- vocabulary,
- colours, etc.

In the city, the two genders defined in this way structure and determine:

- socio-spatial features,
- customs and habits,
- atmosphere (at each level of the community),
- appearance of shop windows,
- the range of goods offered for purchase,
- diversity of stores and workshops,
- diversity of occupations, etc.

An area as a site and a territory: a site is the city itself, the territory being its non-spatial characteristics. The territory is associated by all the components. Non-spatial values of the city are defined (in accordance with the city map and users' opinion) by:

- relationships between open and built-up areas and between public and private areas,
- location of selected function relative to the area of the entire city and other functions,
- the way different functions are combined and the type of functions combined,
- sociotopography,
- physiognomic characters of buildings,
- a criterion according to which the space of the city is differentiated (e.g. ground-rent, distance measure, rhythm of life, etc.),
- directions and causes and spatial mobility of both people and functions in a place,
- the strength which attract different functions or repel one another and the centre,
- relationship between individual spatial components,
- function of an object or a place defining the centre, etc.

Continuation of Table 2

<p>The rhythm of life is defined by principles governing the organization of a community. It is regulated by linear time and related to the beginning and to the end of an activity; it is associated with the perception and representation of time by those who live and work in the city and also by those managing institutions. Time perception determines individual's attitude, life style, and behaviour in his/her own life space and in that of others. The rhythm is created in the city by those staying there; it is related to:</p> <ul style="list-style-type: none"> – time of meals, – time of starting and finishing work/school day, – time designated for breaks and leisure, – the way and place of leisure.
<p>The daily rhythm of the city is defined by:</p> <ul style="list-style-type: none"> – opening hours of institutions and facilities in the city (determine the spatial mobility in the city), – natural phenomena (day and night, the seasons of the year, human attitude towards the time determining the selection of times of day and the seasons to pursue different activities in an appropriate circadian, annual, etc. cycle at different latitudes, some of them are perceived as sacred and others as profane), – institutionalised division of time into working days, days off, and holidays, relationship towards free days and holidays (including Sunday), types of activities pursued on those days depend on perception of sacred, religious, and profane time and are tightly connected to the life style of individuals, classes, and social and cultural groups, they also determine functioning and appearance of the city in each of the seven days in a week and twelve months in a year, – occupations, demographic parameters, world view, and life style of the inhabitants, which change both in the cultural space and in relation to climatic zones and degree of urbanization (urban versus rural areas), etc.
<p>The essence of entertainment is relax and recreation. The need to play and to be entertained lie at the roots of a special entertainment industry; entertainment has:</p> <ul style="list-style-type: none"> – its place in everyday life, – its own specialised cadres with appropriate attire and equipment, – its facilities for people to play and be entertained, – its time for both organised and private events, – special places at homes and in the public space of the city, – special areas in parks, – relationships with education process, – its own patterns and ways to create harmony and conditions for self-realisation, – its own ways to release the energy hidden in each individual, etc.
<p>The meaning of the term „defence” which is a specialised activity undertaken to defend:</p> <ul style="list-style-type: none"> – one's own territory, – faith, – health, – value system, – customs, – heritage, – interests. <p>Defence is served by:</p> <ul style="list-style-type: none"> – the military (the army as protection from other societies), – religion (as protection of an individual from dangers posed by Nature and by the individual himself/herself), – medicine (as protection from diseases), – law (as protection from those disturbing the social and socio-spatial order and as protection of any kind of property).

Continuation of Table 2

<p>A Man protects himself from:</p> <ul style="list-style-type: none"> – forces of Nature (draught, flood, etc.), – threats in a community, – destructive forces in themselves. <p>Each nation and community, both local and a sub-culture, defines what is to be defended and by whom. To study the defence defined in this way, information has to be collected on:</p> <ul style="list-style-type: none"> – threats to an individual and the community, – ways an individual and/or the community defend themselves, – attitude of an individual or the community to the threats requiring defence, – the causes of the defence from those threats, – spatial and functional structure of military, religious, medical, and administrative-legal objects, – symbols and architectural characteristics of the objects identifying their functions, – reactions elicited by the symbols associated with the defence functions, – the degree to which people are aware of their rights and to which they exercise them, etc.
<p>Different tools extending the range of various activities otherwise executed by the human body:</p> <ul style="list-style-type: none"> – evolution of weaponry started from teeth and fists to develop into space arms, – clothing, housing, and heating are mechanisms allowing for controlling body temperature, – furniture replaced the need to crouch or sit on the ground, – transportation replaced the need to use legs and backs, – mechanical tools (glasses, TV, telephone, books, computers, newspapers, photographs, fax machines, text messaging, Internet, etc.) transport the „voice” and the „image” in time and space allowing the Man to see, hear, and feel more than it would be possible with the senses alone. <p>This category includes all the basic types of human economic activities used to produce the necessary tools and means (the paper and weapon industry, manufacture of machines, equipment, and mechanical tools; construction, textile, furniture, communication, and food industries). All those activities may be pursued in the ways giving rise to artisanal or mass production.</p> <p>Characterisation of technology and material use (including information) defined in this way includes:</p> <ul style="list-style-type: none"> – culture of production, – awareness of resources, – resource classification, – human attitudes towards sites at which different activities are pursued, – human attitudes to those who pursue those activities, etc. <p>Places adapted to pursuing different types of activities reflect the technical and technological standards of a community and critically affect the spatial and functional structure of the city, as each production process takes place at a site / in a building that has its own physiognomic features, requires an appropriate personnel, and affects the landscape of adjacent areas.</p>

Source: Pirveli, 2008, pp. 93–107.

The city perceived in this way is a place which concentrates designates serving as components or composites of the semantic urban space. Designates and composites may be constant, mobile, short- or long-lived, and may take on physical or non-physical form.

In other words, designates and composites are effects of human activities perceived by the senses; they are non-linguistic structural elements of the non-verbal urban language. They emerge during human activities in any epoch, as it is the axiological individual who confers the most appropriate form and content, compatible with local societal and natural conditions upon them (i.e. upon buildings, streets, squares, homesteads, institutions, objects, ornaments, items of clothing,

tools, customs). A place becomes embedded in context, whereas a human being creates a set of rules pertaining to guard and enforce the order of things. The context is a vector of the potential of a place and is driven by cultural synergism. The context contains information on complex social and cultural manifestations of life of both an individual and a community. The context can be explored and studied exclusively via a case study, otherwise the social and cultural specificity and identity of the place (its non-spatial quality) may become broken down and annihilated in the light of fixed stereotypes formed by previous macro- or micro-scale studies.

Morphosigns: structural units of the urban space

The origin of morphosigns

Morphology is the science of shapes. In linguistics, morphology deals with forms of inflectionable parts of the speech. Forms of inflectionable physical parts of the urban (or urbanized) space are treated by the morphology of urban form (ISUF, 2017).

Urban form lies at the basis of the city landscape (townscape. ISUF, 2017). As a physical form, it is a system made up by three basic physical elements: 1) constructions and the associated unbuilt-up areas; 2) plots; 3) roads. They are non-divisible, all other physical elements of the city map being only their combinations. Physical elements of the city map are bound together by functions resulting from the aims those elements are to attain. The aims in turn stem from human needs. It is because of a certain need that a human being, when creating an urban form, shapes it so that it is capable of fulfilling the need. These three plan units and their uncountable combinations are the only physical forms of any urbanized area in the world. The contents filling the form result from its geometric parameters, physiognomic characters, and – importantly – are dependent on the underlying socio-economic processes. The city is a multiplication of urban forms united into a system. The urban form defined in this way is the maximal simplification of reality. And because all other physical elements of the city map are mere combinations of the basic elements, a scientist can explore and ponder the urban form thus understood in any spatial- temporal- socio- cultural context. The scope of the context depends on the aim of the study and the way the research objectives are being defined.

For the sake of this study, three basic physical elements of the city plan have been supplemented with a fourth one, the city greenery. Similarly to spatial equivalents of motion (a road, a street) and rest (a place: a square, a building), the city greenery has been considered to be equally tightly bound with the city at each stage of its evolution: the oldest human settlements were placed in oases; in modern cities, with their climatic and edaphic conditions far from adequate for

the greenery, people nevertheless add this element by placing artificial trees and shrubs in concrete floors or finding other solutions to compensate for the lack of true greenery in the city. Moreover, the city greenery is a basic spatial attribute that produces the life-sustaining oxygen; devoid of oxygen, like devoid of a road, a square, and a building, a human being becomes motionless, and interactions – the spatial designates of which make up the city – break down.

The urban language proposed here is not a sole example of borrowing from linguistics and of transferring linguistic insights to a different scientific area. In the urban language, graphemes are replaced by four universal morphosigns and two-component signs developed within them. The universal morphosigns are: 1) a street, 2) a square, 3) a construction, and 4) greenery. They are non-divisible structural elements of the urban space of all times. They are used by the acting individual to express spatial sequences of his/her needs (an equivalent of the linguistic phoneme). The map of culture arranges human needs into PMS (equivalents of the linguistic phonemes). The map of culture is a special type of a template of categories of human activities, the city being their spatial manifestation (Table 1).

Morphosigns and signs

In an alphabet, a letter is recorded in many different ways to emphasize and differentiate between its properties (Ń, ń, Ñ, ņ, Ņ, ñ). This is the case of a morphosign as well. The morphosign is a term proposed here to define a non-verbal graphic element (a street, a square, a construction, greenery). Morphosigns are used to model the customized space. Humans devised countless possibilities of spatial expression of individual morphosigns. Their varieties are called “signs” here. A schematic representation of signs contained in each of four morphosigns is shown in Figure 2.

The “road” and the “place”, i.e. spatial equivalents of motion and rest, are translated in the city into the phenomena of the street and the square. The street is used for moving from one place to another. The square is a place to meet other people and to witness or become involved in various public actions and behaviours.

The street has only one function: motion. However, no street resembles another. Some streets have been laid out above ground, some are placed underground or inside buildings. Some are to serve only pedestrians, other have been devised to be used by vehicles (motorways, runways) or to be used by both pedestrians and vehicles (streets with sidewalks and traffic lanes). A street with shops or a street in an oriental shopping district will look differently from a park lane or a riverfront; some streets have a spatial perspective, others – covered by a roof or surrounded by windowless walls of houses – are devoid of it. A street can be adorned by windows and balconies of residential houses or offices. A street can be covered by asphalt or paved by cobblestones, mosaic tiles or some other material. A street can be broad or narrow, straight or winding, and so on.

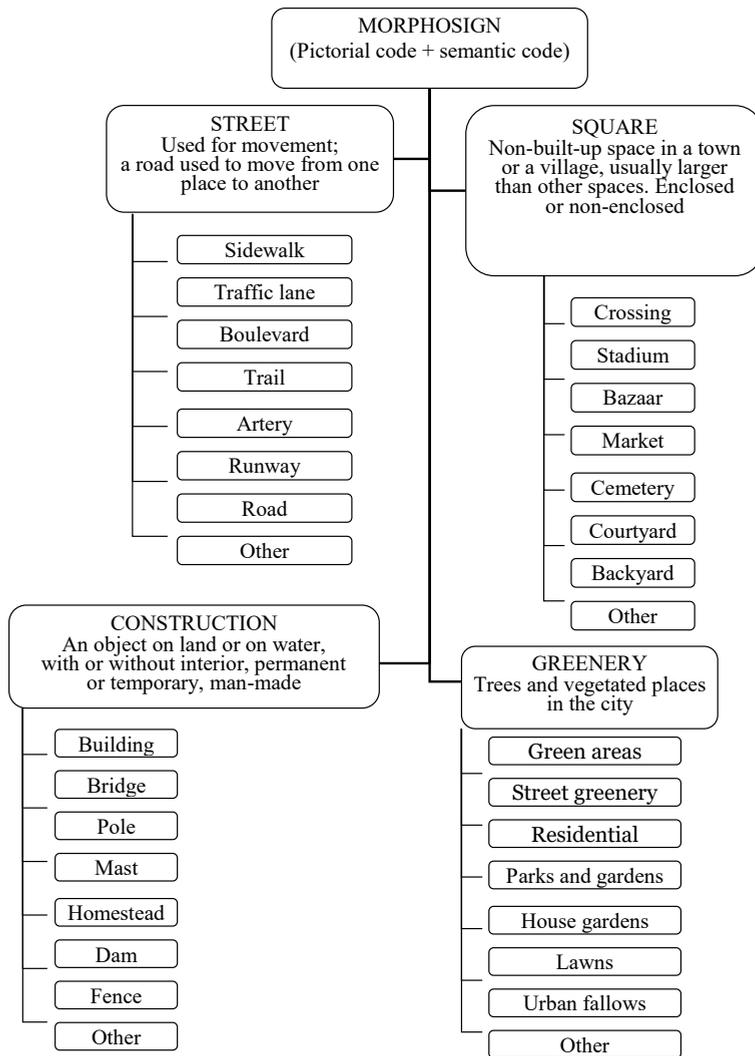


Figure 2. Morphosigns and signs

Source: Pirveli, 2008, p. 132.

- The differences between streets are decided upon by three basic elements:
1. The “wall”, i.e. the structure on the side (the wall is usually formed by buildings and natural or artificial sound barriers. Both the appearance and the function of the street wall are important, influenced by the way the buildings are used. Whether the “wall” composes a construction of houses, residences or offices, whether the ground floor is occupied by shops, what the nature of the shop wa-

res is – all that affect the life of the street by deciding when the people appear there, how many vehicles move there, etc.).

2. The “floor”, i.e. everything that is underfoot (traffic lanes and sidewalks, occasionally lawns and streetcar tracks).
3. The “furniture”, i.e. everything that is inside (the street is usually “furnished” by trees and lamps; sometimes there are benches, phone booths, kiosks, advertisements, graffiti, etc.; the cleanness of the street is a part of the “furniture” as well).

The nature of the street depends on the size and proportions of its walls and floor.

The square is an open space in a contrasting surrounding. The nature of the square depends basically on the elements important for the street, but the meaning of those elements (the walls, the floor, the furniture) is different; different are also dimensions and geometric parameters. Particularly important is the shape of the square (rectangular, circular, short, elongated, regular, irregular). The impression left by the square is sometimes created by a single object which forms a part of the wall or is positioned inside (a town hall, a fountain, a monument, etc.). By their very nature, the squares have more furniture (trees, lamps, benches, other adornments) than the streets. The appearance of different squares demonstrates how an identity of a place can be generated by a variety of components. The square can serve a variety of functions: commerce, recreation, culture. Some squares are used as market places; even when totally covered by stalls or built-up by permanent kiosks, they still remain squares. The square can be a venue of special celebrations, can be used as a parking lot, or can be occupied by homeless or social misfits. The term “square” includes also courtyards and other open spaces contrasting with their surroundings, e.g. cemeteries, playgrounds, gardens, etc.

The building is just a type of a construction with an interior. The city has constructions without interior (masts, poles, bridges, etc). A construction can be placed on the water or on land. Apart from the interior and the situation (water, land), the differences between constructions depend on their longevity, the materials used for the structure and finishing, the size, shape, and external features, the general function, the functions served inside, and the location.

The city greenery, as a morphosign, includes all forms of vegetation, natural or introduced by Man to affect the space. Vegetation-covered places within the administrative boundaries of the city include lawns, parks, trees and shrubs in the streets, residential districts, gardens, and allotments, cemetery vegetation, fields and woods as well as potted plants in the windows and on balconies, visible from the street level.

Individual buildings, together with the space (the street, the square) and the greenery between them form groups and aggregations not only when forming a part of an institution (e.g. a monastery, a university campus), but also when they

make up the city as an institution (Figure 1). Each individual element is at the same time a part of its surrounding. A similar approach to the city space is typical of landscape and urban design.

Morphosign components

The signs expressed within each morphosign consist of two components: the image designator and the meaning designator (Figure 3). The image designator is expressed through a pictorial code, while the meaning designator is transmitted via a semantic code.

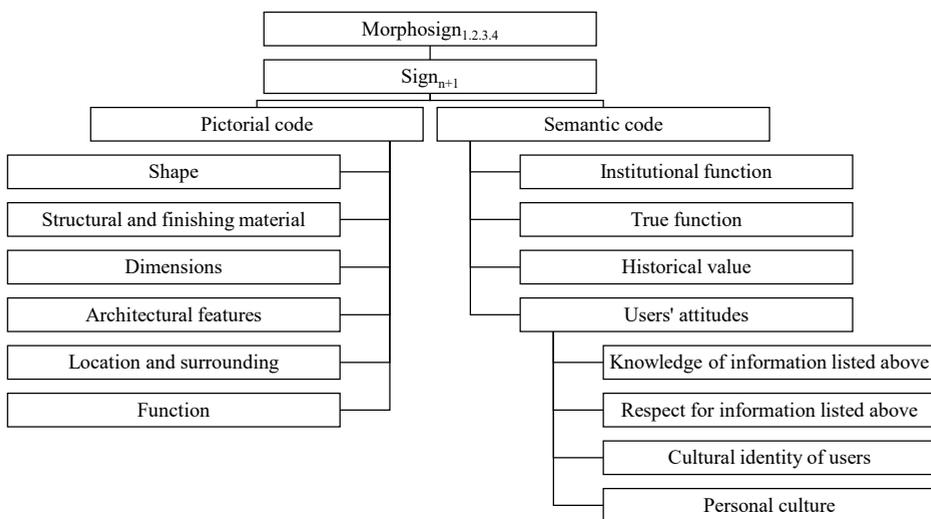


Figure 3. Structure of a morphosign

Source: Pirveli, 2008, p. 133.

The pictorial code covers everything that is visible, easily noticeable both in the city map and in the real space. The appearance of the riverfront is different than that of a side street or a pedestrian district; a residential house differs in appearance from a palace, a church, a bridge or a fountain; the central square is different from a courtyard, a playground, a cemetery or a market square; the green lawn is different than the greenery represented by potted plants on the window sill, etc. The image designator, i.e. the appearance, depends on (Figure 3):

- geometric parameters of the sign (shape, type, size),
- architectural features,
- construction materials,
- finishing materials,

- present or future function of a given sign,
- the ambience.

The semantic code presents a more complex problem. The semantic code is invisible. It stems from:

- a) the present function, which can be prescribed by local authorities or other user (e.g. a parade ground, a former residence converted to a store),
- b) the original function of a given form, which has changed as a result of historical transformations (e.g. city walls of the past become a tourist attraction at present),
- c) the architectural value (e.g. the “curved house” in Sopot),
- d) the attitude of present users to a given physical element; the attitude results from:
 - d1, user’s level of familiarity with information covered by a, b, c,
 - d2, in addition to familiarity, user’s respect to the information covered by a, b, c,
 - d3, user’s cultural background,
 - d4, user’s personal culture,
 - d5, user’s world-view and level of knowledge.

The pictorial and semantic code items require both the information source and techniques for testing. The best source for the pictorial code characteristics is an urban space (inventory method), and for the semantic code – professional documents related to local development or city planning (item a, b, c) and inhabitants (item d; quaternary; observation).

A human settlement, whether prehistoric, built in the 21st century or still on the draftsman’s board, shapes the ambience exclusively through four morpho-signs. Each epoch, and each culture in an epoch, generates and establishes its own standards, its own order and pattern of combining four letters of the urban language. In other words, each epoch and the local culture that it has produced (which is communication) generates an urban space according to the principles of its own “grammar”. Customized space uses – as a means of communication – signs, modified by the acting humans, and the functions of those signs, adapted by individuals to the prevalent socio-cultural and other models. The spatial order and physiognomy of cities in India, China, the Hellenic Greece, and the ancient Roman Empire look differently; still different were medieval cities established according to the Magdeburg or the Neumarkt-Magdeburg town laws; settlements established in areas beyond the reaches of any law differ from Renaissance, Baroque, Hanseatic, Haussmannian, modern, or socialist-Soviet cities, differing between themselves as well. Each of those names evokes a certain silhouette of a city, its spatial arrangement and physiognomic features which are then associated with a certain urban model corresponding to the relevant historical period and culture. Broader information on those city types makes it easy to notice that,

although there are roads, squares, greenery, and objects serving identical functions in each of them, they differ in their construction and appearance. This is a very important part of information on the semantic code of a sign (items b, c), although it does not provide any insight into the morphosign's meaning. It merely identifies the physical form in the light of supra-local and global culture.

The local community declares its attitude towards the physical forms in its immediate surroundings by the attitude of present users to a given physical element (item d). An individual's attitude to the ambience is determined by patterns of the local (or communal) social culture expressed in the space of a given locality. This is where the most important layer of the semantic code of a sign is created. The sign is a key to understanding (and decoding) the semantic code, which can be done exclusively at the case study level. The semantic code provides information on values and on the importance of a given morphosign to its major users and in the local context. The attitude of city inhabitants and all the local entities to their immediate surroundings is the basic measure of the semantic code because the city is primarily their space.

Urban message: a conventionalized record of human activity

Short and long message

Generally, everything that constitutes the interior of the city has a meaning. Its semantic value includes everything that we are able to perceive (Tomasik, 1999; Tuan, 1974; Tuan, 1975). What we see and feel in the city are the culture map key words, located and stored in the customized space (Figure 1). A signal from a city fragment which is experienced or perceived by the senses and immediately forwarded to our memory, similarly to the content matter of a book we are reading, enriches the knowledge accumulated in the memory and searches it. We receive a return signal according to which an individual behaves in a given situation and in a given place.

In the urban space, in the conventionalized record of human activities, the message vector is all information coded in or on morphosigns. Messages may be long or short. In addition to geometric and architectonic features and the characteristics resulting from their primary or secondary function, short and long messages are derived from signs that can be e.g. graphic (rendered by words and drawings on signboards), light-produced (on signboards), placed on street signs, emitted by traffic lights, etc.

A short message is aimed at producing an instantaneous human response on an unqualified assumption that the receiver understands the sign's content unequivocally and according to the sender's intention. Street names, names of institutions, building numbers, written on appropriate information plates and sign boards are intended to guide the pedestrians and motorists. Short messages include also

other types of street information e.g. municipal transportation timetables, opening hours of institutions, number of available service windows at post office, traffic lights, signposts, among others. The semantic code of a short message is the content of the message, but also the attitude of the message addressee (and/or the sender) to the message.

A long message in the city implies a valuation context, available to those willing to learn it. Long messages are embedded in the sender's culture. It is because of long messages a place has its *genius loci*. Correct perception or observation of a difference in something that seems familiar at the first glance (a street, a fountain, a window, a bazaar, a coffee pub, etc.) depends on correct interpretation of the long message involved.

We try, by analogy with a familiar (culture-based) image stored in our memory, to understand what we are seeing in the cultural space-time of the city. Observations of a visible and perceived image may lead to the conclusion that known physical elements (i.e. morphosigns with pictorial and semantic codes) differ somewhat depending on circumstances. When the matter is studied in more depth, it turns out that the seemingly similar images may have, or do have, a different meaning (e.g. a fountain in front of a church versus a fountain in front of a mosque, etc.).

For example, buildings similar to Warsaw's Palace of Culture and Science can be found in Moscow, Warsaw, Chicago or New York (Figure 4). In all those cities, the buildings in question have been constructed in a similar architectonic style and are symbols of authority, power and prestige. In Moscow, such buildings are symbols of pride, as they emphasize the local symbolism either imperial or totalitarian. In Warsaw, the building exemplifies a gift from the Big Brother, while in Chicago or New York such buildings are symbols of the industrial power. However, someone else may interpret this example in a different way. Interpretation patterns emerge as a result of familiarity with the content of a meaningful and complex message.

As maintained by psycholinguistics, the receiver never assimilates 100% of sent information but only a fragment the magnitude of which depends on a situation and the receiver's intellectual capacity. The relationship between the message sent and the message received is shown in Figure 5. When the "urban form" is substituted for the "verbal language", the message is the intention of the construction designer, as shown in Figure 4 and the reception consists of interpretation by a person viewing what is shown in Figure 4. The empty circle in Figure 5 is a message sent (i.e. the building designer's intention), the black area representing the message received (i.e. interpretation). The green part indicates the size of the missed content of the message.



Figure 4. Location context versus meaning of an object in Moscow and Warsaw as well as in New York and Chicago

Source: Pirveli, 2008, p. 146.

We begin to understand the meaning of a long message (the green area in Figure 5 will diminish) when we are able to perceive a component of the urban culture which is most readily sensed, but most intangible and most difficult to conventionalize: the atmosphere. The city atmosphere is created by a variety of factors; it determines the relationship between the message sent and the message received (Figure 5). However, the most important for the creation of atmosphere is the attitude of city inhabitants to everything that exists (as a morphosign) and happens (as a relationship) locally.

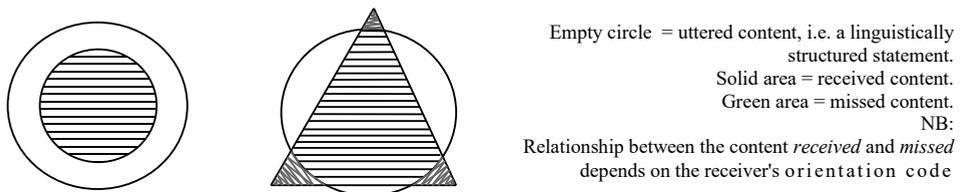


Figure 5. Relationship between the message uttered and its received content

Source: Pirveli, 2008, p. 135 (Image adapted from: Kaczmarek, 1998).

Common Semantic Code (CSC) of a spatial text

The Common Semantic Code (CSC) in the urban language, as in linguistics (Malinowski, 1983) it is a conventional system of non-verbal meaningful signs which make it possible for the spatial information to be processed and deciphered by individuals familiar with the system. A spatial text is a message defined in categories of conscious and non-conscious interpersonal relationships embedded in situations involving humans. Each situation is an outcome of a human action. The urban space is a venue of those actions and a conventional record of all types and categories of activities taking place at that site. Each activity leaves its mark,

a trace – a long or short message. The urban space (as if a sheet of paper) binds the messages together since it is both their binding agent and synthesis (Figure 1).

The message sender is an individual possessing his/her own cultural semantic code derived from both past and present. The sender is anyone who because of his/her profession and position has been exerting influence on all the material elements present in the urban space. The senders include primarily persons involved in spatial planning, but also those participating in the creation of the spatial message. The senders of the continually updated urban space include also inhabitants of the city who, by taking care of the image and standard of their property or houses, introduce changes visible on house façades, among others (bricking-up of openings in the wall or making new openings, changing window frames, painting the external wall, adapting a flat or a house for the use by the handicapped, etc.). The authors of the message are also shop window decorators, graffiti painters or others who place various doodles and scribbles on the walls. Such signs affect the physiognomy of the city and its perception. Sign boards, advertisements, billboards, graffiti, scribbles on the walls – all the components of a street gallery create a specific and very interesting line of studies on the urban space semantics. It seems that those graphic components supplement the message recorded in the city by providing information useful for answering questions such as whom? what? whose?

The receivers are the people living in the present, those who are actually using the city. Thus, the receivers are the city inhabitants, tourists, and those who – because of their respective professions – are involved in the city matters. The receivers know, or think they know and feel, the city because of living there and possessing information about it from the literature, mass media, or oral tradition.

The sender and the receiver, i.e. individuals living or only working in a city can descend from that or the other (e.g. ethnic) culture. Even if descending from a different culture, they also create a smaller or larger part of the urban message. By staying within the space modelled by a culture different than their own they process also their own social and cultural characteristics to attain the best adaptation to the local context. This is an activity which enriches cultural aspects of the spatial context of the urban message. In this way each city is a unique example of a specific cultural synergy.

The text of the urban message is embedded in the sender's and receiver's culture. Their familiarity with the CSC dictates how correctly they will read the message released by the sender and intercepted by the receiver. Numerous factors generating urban atmosphere and a major part of the CSC include:

- a) canons and customs defining rules of behaviour in a given place and in a given situation, set by culture;

- b) customs and rules defining models of behaviour in a given place as well as the degree of compliance to the models;
- c) inhabitants' attitudes to the city as a whole and to its various parts;
- d) physiognomic characteristics of the city and interior of different institutions and places serving particular functions;
- e) opening and closing hours of different institutions and facilities;
- f) attitude of the staff working for institutions to visitors;
- g) lifestyles, social and economic status of inhabitants (visible also on the faces, in gestures, speech, etc.);
- h) attitudes of inhabitants to themselves to visitors and to those who "look differently" (because of the skin colour, clothes, physical and mental fitness);
- i) sounds (speech, music, noise) heard in the city and smells;
- j) human behaviours when in anonymity;
- k) human behaviours in interaction with subordinates (including parent-child, teacher-pupil, etc. relationships);
- l) popular and unpopular places, their location, and – if possible – the cause of popularity or unpopularity;
- m) system of governance pursued by the local (and/or central) authorities;
- n) compatibility between the local governance and expectations of the users;
- o) climatic conditions, topography, etc.

To decode the CSC of the urban message means to detect and reveal the local factor which has shaped the letters of the urban language. The urban language is mute, soundless but when we get to the core of the full semantic code, it will reveal itself, full of expression, and even shouting with joy and crying in sadness.

The composite scanning method

The linguistic language transmits not the language itself, but linguistically organized messages. The urban language transmits not the morphosign itself, but intentions of the sender and the receiver with respect to the function of the morphosign. Each urban form has developed its own language, i.e. its spatial order. The urban language is a technique of releasing messages, coded in the urban space, regarding needs and problems, strengths and weaknesses of authors and users of the spatial message. The task of the urban language is to find a Common Semantic Code (CSC) between and its users.

When using the composite scanning method to study an urban form, the scientist becomes an artisan who scans a dense layer of symbols, reports on the objective or physical urban space (the detailed inventory method) and on the everyday reality based on his/her own observations and responses to questionnaires collected in a given place. The report on the composites scanned is an

in-depth description of the image of the place; it is also an interpretation of the place's interior, as viewed from the culture map perspective.

The scientist's attitude, required by the method, is extremely important. Much depends on the scientist's open-mindedness with respect to perceiving those culture features that are hidden in the physical form. On the other hand, although the visible form may seem familiar, the scientist is ready to view it from the local cultural perspective.

The perception of the city as a spatial manifestation of all activities is a type of composite scanning of the semantic space of the habsphere (a term derived from the word *habitat*). Composite scanning of a space produced by social interactions suggests generation of a socio-cultural profile of the image being scanned, where the composites (component designates) are the material aspects of an individual's activities, as shown in table 1. Information on the composites should be derived from the objective environment and by authors and users of a fragment scanned by the scientist. The task involves at first decomposition, followed by re-synthesis, of the (urban) space. Defragmentation and synthesis make it possible to record the pictorial code of a morphosign making up the space in question, and to penetrate the semantic code.

The specificity of the method is that it combines information that is "objective" and "subjective" (whatever the meaning of those terms) and that synthesizes the information to create a profile of a site being scanned (see section: Morphosign components). The method combines several techniques applicable to:

- collection of information on composites of the case under study,
- ordering the information by certain agreed-upon criteria,
- processing the information to meet the objective.

Information on mobile, permanent, short- and long-lived composites which are physical or non-physical should be collected in the field by:

- inventory (of morphosigns in the culture map),
- photographic documentation (wide-angle and close-ups photographs of selected fragments),
- polls (questionnaires addressed to inhabitants, passers-by, service providers and customers), and
- observation (of human behaviours).

The degree of detail and the manner of ordering the information determine the utility of the materials collected and their repeatability (whether they will be used once or many times; the monitoring baseline). Whatever the decision, it should make it possible to retrieve the required information fast. Fast retrieval of information is facilitated by filing and coding the data using the codes applied to the map of culture.

The composite scanning method involves reproduction of the surface layer of a place (i.e. its most readily observable part) to generate a social profile of the

city, with numerous cultural linkages. The method is very tedious, time-consuming, and multifaceted. It seems, however, to be the only way to explore the site of cultural synergies and to generate an updated, holistic, and objective vision of the city, complete with picturing the culture of its users.

Let us make a reference, again, to linguistics, particularly to the first and the second function of the language. According to the first function, the language is a means of communication. The function of a physical image of the spatial message is similar. The second function of the language is, in addition to being the means of communication, a tool for thinking. The urban language, communicating via non-verbal means, is a message; it is a sequence of human activities and a human product. The function of the urban language (*urbslingua*) as a cultural system is the transfer of local urban culture in time and space.

The metaphor as an interpretation

A human being learns to read and write; the teacher – an individual whose professional experience and qualifications exceed those of a student – checks a text written by a student, pointing out their weaknesses and strengths. The student, when being shown errors, strives to improve spelling or eliminate other mistakes in, e.g., syntax, vocabulary, formatting, etc. In the city, a misspelling has its equivalent in the location of a function in an inappropriate place. Spatial order or chaos can be likened to spatial expression of syntax. The richness of the vocabulary in the spatial text is manifested by the abundance of signs selected to correctly express similar functions. Moreover, the urban space, similarly to a literary text, is governed by certain formatting principles. The urban space formatting requirements are laid out in documents recommending the uses the space it to be put to (e.g. spatial management plan which, when approved by a relevant body, becomes a law). On occasion a similar document may produce erroneous “formatting”. This happens when the authors of spatial plan decide on the use of the space without consulting local people, overestimate model solutions, or disregard local socio-cultural, socio-economic and other factors resulting from valuation of natural resources.

The purpose of checking a spatial text is not to find a culprit, but to reveal the source of the error in order to give more weight to the strengths, to provide space for improvement, and to minimize the weaknesses. Perception of a customized space through human activity template leads (observers, scientists, institutional planners, etc.) to associating the erroneously recorded physical element with an activity it is a spatial manifestation of. An excess of weaknesses in a spatial text activates regression of the city, social and economic decay, and degradation of the space; it engenders stagnation and/or social aggression. Regeneration is a tool with which one brings back the socio-economic equilibrium and, as a result,

brings the decaying or dead part of the city back to life. A balanced application of the strengths of spatial text, along with correct communication between users, lies at the base of the required (by almost any human settlement) regeneration and sustainable development of the city.

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Język miasta (*urbslingua*) – metoda fenomenologiczna

Słowa kluczowe: fenomenologia, mapa kultury, język miasta, morfoznak, metoda

Streszczenie. W artykule scharakteryzowano język miasta (*urbslingua*) jako fenomenologiczną metodę. Jest ona osadzona w nauce o mieście (*urban study*). Metoda ta stanowi narzędzie służące do identyfikacji zjawisk przestrzennych występujących w przestrzeni miasta i badanych w ujęciu holistycznym. Miasto jest postrzegane jako komunikat

przestrzenny, a przestrzeń miejska jako wielowarstwowy tekst przestrzenny. Ów tekst jest napisany morfoznakami. Morfoznak (odpowiednik językowego grafem) jest niepodzielnym elementem strukturalnym zurbanizowanej przestrzeni. Morfoznak wyłania się z formy morfologicznej miasta (zdefiniowanej przez ISUF); desygnuje wszystkie typy działalności człowieka, których przestrzenne odbicia znajdują się w mieście. Przestrzeń miejska jest ich syntezą i spoiwem. Morfoznaki są powiązane przez kulturę, która jest nawigatorem miejskiego porządku przestrzennego, tj. jest syntaxem.

Citation

Pirveli, M. (2017). The Urban Language (*Urbslingua*) – Phenomenological Method. *Marketing i Zarządzanie*, 4 (50), 25–51. DOI: 10.18276/pzfm.2017.50-03.

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Importance-Performance Analysis of Ski Destinations in Sweden – Comparison between Two Destinations

JEL codes: Z32, M31, M19

Keywords: tourism, tourism development, importance-performance analysis, ski destination

Summary. The aim of this study was to investigate the tourists' level of satisfaction concerning different factors at two ski destinations in Sweden in order to find key attributes that can create tourism development in the region. At the destinations, tourists are co-creators of value and it is therefore important to take their opinions into account. The data was collected by quantitative questionnaires consisting of 40 attributes that were graded on a Likert scale from 1 to 6. The questionnaire was handed out and responded by 373 tourists at the selected ski destinations. For most of the attributes the results indicate that tourists are satisfied with the performance of the tourist service providers at the destination. There are five attributes on each of the destinations that need further development in order to improve the overall experience of the destination. The result can be used for tourist producers in order to develop the destinations by addressing the issues raised by tourists. It is not only important for the tourists with the ski experience but also other attractions and offers at the destination that contribute to the overall experience.

Introduction

The tourism sector is Europe's largest industry representing over 60 per cent of all the tourism in the world and it is expected to grow even more (UNWTO,

2014). The resources within tourism are limited due to environmental, economic, social and cultural aspects and previous research shows that these limited resources will not survive continued growth without negative consequences for the earth (Tao, Wall, 2009; Sörensson, 2011, 2010). Nevertheless, tourism is most often seen as a survivor of economic development in regions and communities that are sparsely populated. In the increasingly competitive tourism industry, tourists have an unlimited choice of destinations (Murdy, Pike, 2012) which indicates that tourism service providers at the destination must work hard to satisfy their tourists needs and wants. Especially in regions where tourism is the main industry it is of great importance that the tourists are satisfied with the quality of the experience (Wilkins, Merrilees, Herington, 2007; Grönroos, 2007). Providing satisfying visitor with experiences is the goal of tourist destinations in order to build strong relationships with tourists (Ziegler, Dearden, Rollins, 2012). The strategy of a destination is to create ongoing relationships with tourists in order to create loyalty and stimulate a repeat purchase (Murdy, Pike, 2012). By creating loyalty, value is added for tourists and the need for marketing is reduced. The Service-Dominant logic (S-D Logic) pays attention to the fact that a tourist plays an active key role in co-production of activities and in the co-creation of value (Spohrer, Maglio, 2006; Vargo, Lusch, 2004a, 2004b, 2007, 2008). While it is a common focus from a “traditional” management perspective on tourism production that tourism service providers are selling products and services, there is recent research that argues that tourists do not buy solely services and products. They buy different types of experiences. Pine and Gilmore (1999) argue that in a contemporary economy firms no longer sell services but different experiences to tourists.

For a tourist destination, tourists are experiencing complete destination experience when visiting the site. It is therefore of great importance that tourists are satisfied with the experience in order for them to return or recommend the destination to other desirable customers. It is also important to offer what the tourists value and find important at a destination. If the experience at the destination meets the tourists expectation, then tourists will be satisfied and might return to the destination or seek similar experiences (Ziegler, Dearden, Rollins, 2012). It is therefore central to understand tourists’ motivations and their needs. At the destinations it is of vital importance to understand not just the needs and wants, but also what satisfies tourists and what could be improved (Yoon, Uysal, 2005). Satisfaction is the ability of the tourism service providers at the tourist destination to meet the expectations of a tourist. It is the way to measure the quality of tourist’s experience. By gathering this information, tourism service providers can try to fulfill the expectations from tourists. Tourists are also a part of the process as a co-creator of value. The experienced value of an offer depends on tourist’s participation since the value is created during consumption. It is important to gather as much information as possible about tourists in order to create sustainable relations. Only by

good knowledge of the needs, wants and behavior of tourists can the management organize co-created experience that will meet tourists' expectations of value. Tourists have different needs which depend on their subjective service quality needs. Destinations therefore need, more than ever, to create methods for continuing knowledge about the expectations, needs and behavior of tourists (Vargo, Lusch, 2004a; Kristensson, 2009). For destinations, it is vital to have satisfied tourists that will return to the destination in the future.

The aim of this study is to investigate tourists' level of satisfaction at two ski destinations in Sweden, and compare them, in order to find key attributes that can create tourism development in the region. In order to fulfill the aim Importance-Performance Analysis (IPA) is applied in a study of these two ski destinations. The study uses IPA to identify possible strengths and weaknesses in the performance at the destination. This technique is used to understand tourists' level of satisfaction with regard to their expectations of service performance (Tosun, Temizkan, Timothy, Fyall, 2007). The results of the study contribute to the marketing theories and can also be used within destination management to improve their performance and work more efficiently making use of the factors tourists think are the most important.

Tourist destination and value creation

For many tourism destinations, tourism is an essential part of the development and growth of the region and many countries are heavily dependent on tourism to maintain and increase their level of income and employment (Archer, 1996; Sharpley, 2002). Tourism is considered to be the savior for economic wealth and development in many countries and regions and it is becoming a 'base industry' in some countries (Visita, 2013). Consequently, destination stakeholders must find strategies for keeping their destinations attractive for tourists, as well as for investors (Buhalis, Fletcher, 1995; Weaver, 2012). Tourism, as an industry, differs from most traditional industries since tourists must be imported to the destination in order to take part in the offer. Tourists are co-producers in the tourism offering which means that they take an active part in the production, delivery and consumption. At the tourist destination offered experience involves many co-operative collective bodies, but at the same time there are individual business competitions at the site (von Friedrichs Grängsjö, Gummesson, 2006).

Elbe (2003) argues that the offer at a destination is divided into attractions and facilities. The attractions represent the motives of the trip whereas the facilities make the trip possible. The combination of these two creates the complete tourist experience (von Friedrichs Grängsjö, 2003, p. 146). At a ski destination the main attraction is the mountain with ski slopes but since there exist many ski destinations it might be other factors or facilities that convince a tourist to choose

a certain destination. Different tourists could have various purpose of the trip and so could also different stakeholders and tourism producers, i.e. public and private sector could have a variety of motives with their investments at a tourist destination. The optimal situation for keeping tourism destination attractive would probably be if the tourist perception of the destination from their assessment of importance was compatible with the performance of the stakeholders at the tourist destination. According to Wahab and Pigram (1997) the tourist map will be different tomorrow when compared to today. The difficulty lies in predicting where tourists want to go in the future and what will be the main value for the customers. Consequently, destinations need to find tools to create a more attractive but yet sustainable tourism from various perspectives. By listening to tourist the destination's stakeholders can learn more about which factors are important.

Pine and Gilmore (1998) argues that there is a difference between services and experiences. "An experience occurs when a company intentionally uses services as the stage, and goods as props, to engage individual customers in a way that creates a memorable event" (Pine, Gilmore, 1998, p. 98). Prahalad and Ramaswamy (2004) discuss co-creation and its relation to experiences. It is important to "create an experience environment in which consumers can have active dialogue and co-construct personalized experiences; product may be the same but customers can construct different experiences" (Prahalad, Ramaswamy, 2004, p. 8). Prahalad and Ramaswamy (2006) together with Payne, Storbacka and Frow (2007) see tourists not as a passive audience but instead an active partner. By listening to what tourists find important it is possible to create memorable experiences. When tourists travel to a certain destination it is the tourist's personal value that decides if s/he is satisfied. In that sense value creation is embedded in personalized experiences. Morgan, Elbe and Curiel (2009, p. 201) argue that "the experience economy concept is closely related to tourism both in its origins and its implications". A customer goes from being passive to an active participant in the experience (Morgan, Elbe, Curiel, 2009; Pine, Gilmore, 1999). At a tourist destination there will therefore be a need for a wider choice of things to do like shopping, restaurants, cultural and sporting activities due to different segments among tourists (Morgan, Elbe, Curiel, 2009). Abe (2005, p. 6) argue that "the increasing importance of services is not limited to the service industry" but that added value through added services has become crucial for tourist companies which are competing. Services are not only a business of its own, the total offer made to a customer involves different kind of value-deliveries at the destination. Organizing the total co-produced offer to different tourists is more problematic at a tourist destination than in many other industries since there are several tourist producers that have to cooperate in order to provide a valuable experience to tourists (von Friedrichs Grängsjö, 2003, p. 145). A tourist considers a destination as the experience and it is difficult to separate the value delivered by different

experience-providers during holidays. Therefore it is crucial to ask tourists what they find important and what they think of the performance of the destination. Only by asking them will destinations have the possibility to offer a high service quality on their tourist experiences.

Research design

The study was conducted during the end of December 2012 – beginning of January 2013 at two tourists destinations of Vemdalen and Åre in Jämtland, Sweden. Both destinations have a clear focus on alpine skiing. Data collected could be reflected for this chosen period but cannot illustrate tourists experience during the whole year. The research design was constructed as an explorative study on the development of tourist destinations. Two destinations were selected based on several aspects. Åre is the largest destination in northern Europe and Vemdalen is the fourth largest in Sweden. They are both situated in the same county and the lift system is owned by the same company, Skistar (see www.skistar.com for more info).

A questionnaire was designed and handed out to tourists at two destinations hotels, restaurants and in the village. The focus area of the questionnaire consisted of 40 attributes, deriving from previous research (Hudson, Shepard, 2008; Sörensson, von Friedrichs, 2013). Five main fields were selected concerning 40 attributes; accommodation, activities, food, travel and environment at the destination. The questionnaire also had some demographical questions. Tourists had to grade, on a scale from 1–6, their satisfaction and the level of importance. This paper is based on the data received from 373 questionnaires; 243 from tourists in Åre and 130 from tourists in Vemdalen. We conducted an Importance-Performance Analysis (see more about IPA in chapter 4) to detect which attributes tourists consider to be the most important and the destination's performance in that respect.

Two destinations

Two destinations that were selected will be described more in detail in the following section. Åre and Vemdalen are both situated in the same county, Jämtland in Sweden, and 34.5% of all ski tourism in Sweden is in that county (Figure 1). There are around 250 different ski areas in Sweden (www.slao.se). For the county tourism is a major economic industry with a yearly turnover at 3.9 billion Swedish crowns (<http://www2.jamtland.se>). Both ski destinations are owned by Skistar (it also operates ski destinations in Salen, Trysil and Hemsedal).

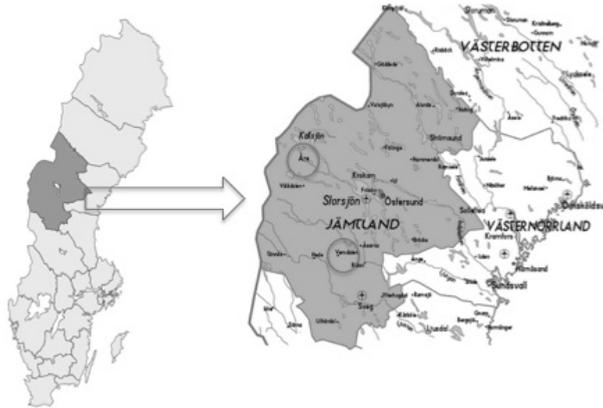


Figure 1. Location of two destinations Åre and Vemdalen

Source: <http://stadskarta-sverige.blogspot.com/2011/06/jamtland-karta-over-staden.html>.

Vemdalen is situated in southern parts of the county and consists of four villages (three ski areas) shown in Figure 2.



Figure 2. Four villages of Vemdalen

Source: www.skistar.com/vemdalen.

The destination has long traditions as a popular destination and is one of Scandinavia's most snow- sure ski destinations, but the area is becoming a year-round destination. A growing number of people realize how much the destination has to offer also during snow free season. Vemdalen ski destinations are all included in the same ski pass. The system consists of 33 lifts and 54 slopes. In 2010/2011 Vemdalen had 516,000 ski days (sold ski passes according to www.skistart.com/vemdalen). A unique investment was finalized before the season 2011/2012: Vemdalskalet is the first Scandinavian ski destination to build a modern six-seat

chairlift in the children’s and novices’ ski area (www2.jamtland.se/index.php/en/destinations/vemdalen).

Åre is the largest winter ski destination in northern Europe. The destination has a long history going back as early as in the 12th century, thousands of pilgrims from all over Europe visited the village on their way to St. Olaf’s grave in Nidaros, nowadays Trondheim. Åre and its surroundings as a destination for tourists was developed in the later part of the 19th century, initiating the transformation of Åre from a farming village to an international ski destination. In the early days the main focus was on summer tourism and, as late as the 1970s Åre had just as many visitors during summer as during winter (www.skistar.com/en/Are/About-Are/History/). Nowadays, tourism is by far the most successful industry in Åre with around 450,000 visitors per year and about 32,000 beds, there are plenty of hotels and cottages. Åre is the leading Nordic mountain destination all year round (www.are.se/naeringsliv/naeringslivsutveckling). Åre ski area consists of 47 lifts (including 5 treadmills) and 114 runs and has a total capacity of approximately 50,000 people per hour. In 2008, Åre got a new record for a number of ski days, i.e. 1,088,000. Åre consists of five villages (Åre, Björnen, Duved, Tegefjäll and Rödkullen) that are shown in Figure 3.

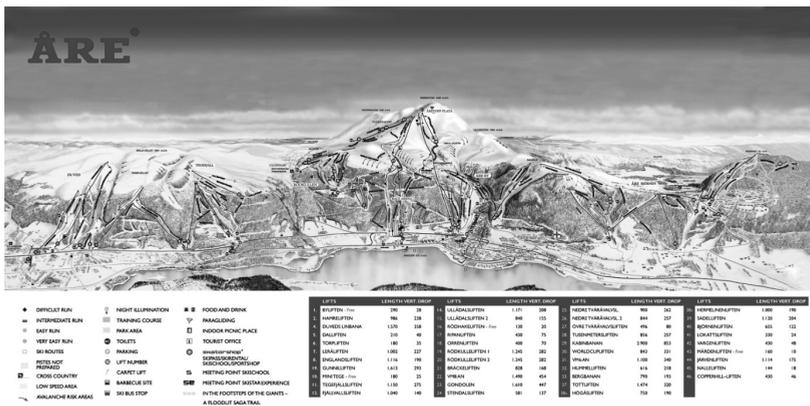


Figure 3. Åre five villages and ski system

Source: www.slao.se; www.skistar.com/are.

Importance-Performance analysis

Importance-Performance Analysis (IPA) is an effective model dating back to the 1970s (Chu, Choi, 2000; Deng, Kuo, Chen, 2008; Matzler, Bailom, Hinterhuber, Renzl, Pichler, 2004; Oh, 2001; Caber, Albayrak, Matzler, 2012; Taplin, 2012). The IPA technique has been successfully used in different research fields, such as

the service industry and automobile industry and lately within the tourism research (Martilla, James, 1977; Sethna, 1982; Chu, Choi, 2000; Oh, 2001). It is a popular managerial tool for identifying strengths and weaknesses; the technique is used to understand the tourists' level of satisfaction that comes from their expectations of a service's performance. Within the service industry the IPA technique has been used as an alternative to the SERVQUAL instrument (Parasuraman, Zeithaml, Berry, 1988; Chu, Choi, 2000). Many studies are conducted using the IPA model in tourism studies (Hemmasi, Strong, Taylor, 1994; Evans, Chon, 1989; Keyt, Yavas, Riecken, 1994; Hsu, Byun, Yang, 1997; Lewis, 1985; Lewis, Chambers, 1989; Almanza, Jaffe, Lin, 1994; Martin, 1995; Sörensson, von Friedrichs, 2013). The IPA model is graphically presented as a grid divided into four quadrants (see Figure 4). The X-axis illustrates the tourists' perceived performance and the Y-axis illustrates the importance in relation to the attributes.

IMPORTANCE	Q1: Concentrate Here	Q2: Keep up the Good Work
	High Importance	High Importance
	Low Performance	High Performance
	Q3: Low Priority	Q4: Possible Overkill
	Low Importance	Low Importance
	Low Performance	High Performance
	PERFORMANCE	

Figure 4. Important-Performance Analysis

Source: Chu, Choi, 2000, p. 365.

Q1: Attributes are perceived to be very important to respondents, but performance levels are fairly low. This suggests that improvement efforts should be concentrated here.

Q2: Attributes are perceived to be very important to respondents, and at the same time, the organization seems to have a high level of performance in these activities. The message here is to keep up the good work.

Q3: Attributes here are rated as having low importance and low performance. Although performance levels may be low in this cell, managers should not be

overly concerned, since the attributes in this cell are not perceived to be very important. Limited resources should be expended in this low priority cell.

Q4: This cell contains attributes of low importance, but where performance is relatively high. Respondents are satisfied with the performance of the organization, but managers should consider present efforts on the attributes of this cell as being superfluous/unnecessary. (Chu, Choi, 2000, p. 356; Zhang, Chow, 2004, p. 83; Sörensson, von Friedrichs, 2013, p. 17).

A critical point of the IPA analysis is the selection of attributes (Martilla, James, 1977; Caber, Albayrak, Matzler, 2012). When developing the attribute list, focus must be on previous research, focus groups and unstructured personal interviews (Griffin, Edwards, 2012; Caber, Albayrak, Matzler, 2012). At the first stage of the analysis, destination attributes are determined from previous studies (Hudson, Shepard, 2008; Sörensson, von Friedrichs, 2013). These attributes are then being scored by the respondents on a Likert scale (Griffin, Edwards, 2012; Caber, Albayrak, Matzler, 2012). It is then based on mean performance and mean importance for each of the attributes of a service (Taplin, 2012). Tarrant and Smith (2002) argue that IPA should be modified and that it should include a measure of statistical variance in addition to mean values. In this article it has been used on mean value.

Demographic characteristics

For these 373 respondents, 130 were tourists of Vemdalen and 243 were tourists of Åre. Table 1 shows the demographic characteristics of the respondents for both destinations.

Vemdalen

Majority of the respondents were female (53.5%) and 46.5% were male tourists. Almost 90% of tourists were between the age of 24–53. Almost half of the tourists have visited Vemdalen more than seven times (46.2%), meanwhile 14.6% have been first time visitors. 32.3% have been to Vemdalen before and up to four times. A third of the tourists stay for 3–4 days (33.5%) and another third stay for around a week (35.9%). 17.2% stay for up to two weeks. That many tourists in Vemdalen (17.2%) staying for up to two weeks can be explained by the questionnaire being handed out during December-January when many tourists have a longer holiday. They travel mainly by their own car to the destination (90.8%). 1.5% travel by airplane, less than 1% by train and the rest comes by bus (6.9%). For Vemdalen over 90% come by car which can be explained by a lack of train station at the destination. The tourists stayed in rented apartments or houses (51.1%) or in a hotel (9.2%). Almost a third of them stayed in their own house or apartment (31.3%). Many of them also travelled with their family (76.3%) and almost a fifth

with friends (19.1%). The main reason for the trip is alpine skiing (89.3%) and 3.8% want to hang out with their family or friends.

Åre

Majority of the respondents were male (55.6%). The tourists are young with almost 63% being 33 years old or younger. A large amount have been to Åre seven times or more (42%) and almost a third have been there 1–4 times before. 14% are first time visitors. A fifth of the tourists are one-day tourists (20.6%) and 28.3%

Table 1

Demographic characteristics of the respondents (%)

Demographic characteristics	Tourists of Vemdalen	Tourists of Åre	Demographic characteristics	Tourists of Vemdalen	Tourists of Åre
Sex			Travel companions		
Male	46.5	55.6	With family	76.3	41.1
Female	53.5	44.4	With friends	19.1	41.5
Born			Conference	2.3	13.7
1940–1949	3.9	4.2	Other	2.3	3.7
1950–1959	3.9	8.8	Main reason for the trip		
1960–1969	34.4	9.6	Alpine skiing	89.3	49.0
1970–1979	24.2	14.6	Cross country skiing	0.8	10.5
1980–1989	20.3	29.3	Hang out with family/friends	3.8	11.7
1990–1999	13.3	33.5	Relaxation	2.3	10.0
Number of stays at the destination			Other	3.8	18.8
Never	14.6	14.0	Travel to the destination		
1–2 times	10.8	21.8	Airplane	1.5	10.1
3–4 times	21.5	14.4	Own car	90.8	63.9
4–6 times	6.9	7.8	Train	0.8	21.0
7 times or more	46.2	42.0	Bus	6.9	5.0
Duration of stay			Accommodation type		
1 day	11.0	20.6	Hotel	9.2	49.0
2 days	1.6	11.2	Own house or apartment	31.3	10.5
3–4 days	33.5	28.3	Rented house or apartment	51.1	11.7
5–6 days	17.1	11.6	Guesthouse/bed and breakfast	2.3	10.0
1 week	18.8	18.5	Other	6.1	18.8
8 days–2 weeks	17.2	4.8			
More than 2 weeks	0.8	5.0			

Source: own elaboration.

are there for 3–4 days. 30% of the tourists stay for 5 days up to a week. 41% travel with friends and 41% travel with family. 14% are in Åre due to a conference. The main reason for travelling to Åre is due to alpine skiing. Around 10% to hang out with family or friends, 10% for cross country skiing and 10% for relaxation. 63.9% travel by their own car to Åre, 10.1% come by airplane and 21% take a train. In Åre, over one fifth take a train which has a train station in the center of the village. Half of the tourists stay at a hotel, 10.5% stay in their own house or apartment and 11.7% have rented a house or an apartment.

The demographic characteristics of the respondents were Table 1.

Importance-performance analysis of two ski destinations in Jämtland

The results of this study provide some clear indications regarding tourism from the tourists' perspective at these two ski destinations. The study of the tourism in Jämtland should be considered as a first step towards gaining more knowledge about the factors tourists think are important when they visit a winter destination. There are some important results that will indicate what tourism destinations should think about when developing an attractive and sustainable destination. For these destinations in Jämtland, with a long history of tourism based on nature experience, it is important to keep the destination attractive for both returning tourists and also for new tourists at such destination. This may affect the destination in several ways and one example is managing the balance while depending on different tourists' valuable perceptions. This is a common issue that concerns different stakeholders at a destination; stakeholders such as tourism service providers, public bodies and civic society holding different agendas. Another example is to find common strategies for the performance of desired values by the collective of stakeholders at the destination. The theoretical view of sustainable tourism must be adjusted to practice so that it can be applied successfully in the tourism industry. One way to do this is to investigate the factors that are important for different kinds of tourists.

For the tourists at destination Vemdalen the results showed the following.

Q1: Concentrate here. This quadrant is important to address for a destination since it is of importance for the tourists but the destination has low performance. In Vemdalen tourists think that there are few restaurants to choose from. There is also an issue concerning food stores and the queues there. Tourists also find health care to be an attribute that the destination should concentrate on. Finally, tourists would like the destination of Vemdalen to focus on the environment concerning waste collection.

Q2: Keep up the good work. "Keep up the good work" attributes are quite many. The accommodation and its service is fine. The destination also offers relaxation, good information signs, good ski shop and a good service delivery at

restaurants. The same opinion is shown for food stores service as regards the staff. The destination has good snow shoveling and parking. The main attraction, ski system, is also scoring high. Attributes in “Keep up the good work” concerning lifts, different slopes, lift queues, opening hours, slope up and service in the lifts are perceived as fine. There are also good amount of toilets and the treatment by other skiers is good (social factor). Finally, the tourists think that they get a good value for money and the overall impression of the destination is good.

Q3: Low Priority. “Low priority” attributes for the destination of Vemdalen are also quite a few. Transportation at the destination, after ski activities, shopping and local food are of low priority. Other sport activities, spa, cinema, babysitting and off-piste are also perceived as low priority. Environmental issue focusing on water saving and restaurants in the ski pistes are not important.

Q4: Possible overkill. There are attributes that are possible overkill for the destination to focus on. Entertainment, tourist information and ski school are graded as such by the tourists.

The result for Vemdalen is summarized in Table 2.

Table 2

Importance-Performance analysis of the destination of Vemdalen

Attribute	Vemdalen		IPA
	performance	importance	
	mean	mean	
1	2	3	4
Accommodation	4.86	5.04	keep up the good work
Service at accommodation	4.60	4.95	keep up the good work
Transport at destination	3.79	3.97	low priority
Entertainment	5.07	3.18	possible overkill
After ski activities	3.71	3.47	low priority
Shopping	3.71	3.31	low priority
Local food	3.71	3.86	low priority
Relaxation	4.29	4.37	keep up the good work
Tourist information	4.14	3.93	possible overkill
Signs at destination	4.26	4.78	keep up the good work
Restaurants	3.72	4.41	concentrate here
Restaurant service	4.45	4.84	keep up the good work
Ski shop	4.72	4.51	keep up the good work
Health care	3.93	4.90	concentrate here
Food store	3.49	4.54	concentrate here
Food store queue	3.91	4.70	concentrate here
Food store service	4.18	4.46	keep up the good work
Sport activities	3.48	3.43	low priority
Spa	3.22	3.19	low priority

1	2	3	4
Activities	3.37	3.19	low priority
Snow shoveling	4.50	4.62	keep up the good work
Parking	4.23	4.94	keep up the good work
Baby care	3.05	2.39	low priority
Cinema	2.54	2.04	low priority
Lifts	4.58	5.29	keep up the good work
Different slopes	4.49	5.12	keep up the good work
Number of lifts	4.62	5.05	keep up the good work
Lift queues	4.38	5.11	keep up the good work
Off-piste	2.88	3.42	low priority
Lift opening hours	4.20	4.99	keep up the good work
Slope up	4.46	5.33	keep up the good work
Lift service	4.75	4.97	keep up the good work
Toilets	4.09	4.71	keep up the good work
Other skiers	4.17	4.47	keep up the good work
Restaurants in ski slopes	3.70	4.27	low priority
Ski school	4.51	3.83	possible overkill
Environment - waste	3.51	4.36	concentrate here
Environment - water	3.69	4.25	low priority
Value for money	4.24	4.93	keep up the good work
Destination as a whole	4.76	5.36	keep up the good work
Mean value	405	431	

Source: own elaboration.

For the tourists at destination Åre the results showed the following.

Q1: Concentrate here. This quadrant is important to address for a destination since it is of importance for the tourists but the destination has low performance. For the destination of Åre there are five attributes that are important to address in order to satisfy tourists. Parking and lift queues are issues that need to be improved. There is also an issue with the food store, toilets at slopes and health care in Åre.

Q2: Keep up the good work. “Keep up the good work” attributes are quite many in Åre. Accommodation, its service there, restaurants, service level of restaurants and relaxation are attributes that are satisfactory and important for the tourists. Attributes concerning the ski system are also fine, but the lifts, different slopes, amount of lifts, opening hours at the lifts, slope up and lift service are important. Finally tourists believe that travelling to Åre gives them value for money and the destination as a whole is good.

Q3: Low Priority. “Low priority” attributes, for Åre, are environmental aspects such as waste collection and water saving. Low priority refers to transport at the destination, shopping, use of local food, queues at food stores, sport activities, other activities and snow shoveling. Other activities like cinema, babysitting

and ski school are less important. Attributes connected to alpine skiing like off-piste, behavior of other skiers on slopes and the amount of restaurants in the lift system are of low priority.

Q4: Possible overkill. Finally tourists of Åre think that entertainment, after ski activities, tourist information and signs are possible overkill. Attributes like ski shops, spa and service level at food stores are also not important for tourists in Åre.

The results for Åre are summarized in Table 3.

Table 3

Importance-Performance analysis of the destination of Åre

Attribute	Åre		IPA
	performance	importance	
	mean	mean	
Accommodation	4.98	5.12	keep up the good work
Service at accommodation	4.72	5.17	keep up the good work
Transport at destination	3.95	4.41	low priority
Entertainment	5.02	4.34	possible overkill
After ski activities	4.59	4.31	possible overkill
Shopping	3.59	3.50	low priority
Local food	3.98	3.83	low priority
Relaxation	4.64	4.58	keep up the good work
Tourist information	4.38	4.32	possible overkill
Signs at destination	4.38	4.37	possible overkill
Restaurants	4.56	4.89	keep up the good work
Restaurant service	4.69	5.10	keep up the good work
Ski shop	4.67	4.25	possible overkill
Health care	4.03	4.96	concentrate here
Food store	3.60	4.51	concentrate here
Food store queue	3.80	4.37	low priority
Food store service	4.27	4.35	possible overkill
Sport activities	4.06	3.83	low priority
Spa	4.54	4.23	possible overkill
Activities	4.08	4.14	low priority
Snow shoveling	4.16	4.32	low priority
Parking	3.68	4.78	concentrate here
Baby care	3.30	3.08	low priority
Cinema	2.25	2.81	low priority
Lifts	4.72	5.20	keep up the good work
Different slopes	4.82	5.31	keep up the good work
Number of lifts	4.71	4.99	keep up the good work
Lift queues	4.18	4.93	concentrate here
Off-piste	3.94	4.07	low priority

Lift opening hours	4.81	4.72	keep up the good work
Slope up	4.63	4.90	keep up the good work
Lift service	4.53	4.74	keep up the good work
Toilets	3.65	4.68	concentrate here
Other skiers	3.91	4.28	low priority
Restaurants in ski slopes	4.08	4.43	low priority
Ski school	3.95	3.49	low priority
Environment - waste	3.81	4.35	low priority
Environment - water	3.57	4.31	low priority
Value for money	4.32	5.15	keep up the good work
Destination as a whole	4.94	5.48	keep up the good work
Mean value	4.21	4.47	

Source: own elaboration.

Discussion

The aim of this study is to investigate the satisfaction level of tourists concerning different factors at two ski destinations in Sweden. By finding these key attributes they can contribute to the creation for tourism development in the region. There are several aspects to take into account from this study. When tourists travel to destinations they come with their needs and wants expecting the destinations to fulfill them. The tourism service provider cannot on its own create tourism experience – it is created together with tourists. What tourists value as important is therefore of great concern for the tourism service provider.

Both destinations are mature in the destination's lifecycle. This affects tourism development since tourism is constantly developing. Tourists have higher expectations than before and they are not just going skiing when travelling to a ski destination. The main activity at both destinations is alpine skiing. It is therefore very important that the lifts and slopes give the tourist a high value. That is the key experience for holidays, despite there are many aspects that are co-creating the complete offer. Lifts and slopes are attributes that are good according to the tourists' opinions. Number of lifts, great opening hours, good slopes and service-minded staff in the lifts are also good. Tourists are not that interested in off piste skiing since it is of low priority at both destinations. Other attributes concerning activities are spa, sport activities, ski shop, babysitting, cinemas and health care. There is a low priority for many of these except health care that both destinations should concentrate on. Skiing experience is the main reason but tourists are also searching for other things to do at the destination like dining, shopping, swimming and so on. It is therefore important to have an active dialogue with tourists to learn more about their needs and wants. Together with them the experience is created. There are many ski destinations that tourists could choose

from and there is a strong competition between them. Therefore it is important to have satisfied and loyal tourists. Two destinations belong to the same company (Skistar) and thus they should have different tourist segments. Vemdalen is known as more family oriented destination compared to Åre.

The result from this study has shown that there are high amounts of returning tourists (over 42% respectively, 46% have been at the destinations more than seven times). This shows that the destination is well-established (e.g. mature) and probably has quite satisfied tourists. It also makes it even more central to address the factors raised by the tourists as important. It is good for tourist producers to have a large amount of returning tourists since they do not have to focus their effort on attracting new ones but rather satisfy those that return to the destination.

The destinations also have different segments shown by tourists' travel companions where Vemdalen has a larger amount of families (76%) compared to Åre (41%). 76% travel with families to Vemdalen, meanwhile only 41% to Åre. It is important to study different segments since they might have different view on what they see as valuable for the destination.

The IPA showed that attributes concerning accommodation are good at both destinations. Accommodation consists of houses and apartments that tourists own at the destinations. Also, a large amount rents a house or an apartment or stays at hotels. These tourists are therefore of importance since they are owners of houses or apartments and have a strong tie to the destination. Attributes that addresses food are restaurants and their service. In Åre tourists are pleased with both, but in Vemdalen there is a focus on too few restaurants to choose from. This is an important attribute that Vemdalen should address. The use of local food is low prioritized which is an interesting result especially since the county is current food capital of Sweden. In Vemdalen there is also an issue about the queues in food stores.

Environmental issues are not of significant importance despite the fact that destinations nowadays try to be more sustainable and contribute more to the community-based entrepreneurship. The above excludes waste collection in Vemdalen since this destination should concentrate on it. Tourists do not value sustainable tourism especially high despite that it is of great importance for the tourism to survive in the future. The use of data from tourist questionnaires is important for destinations to raise the service quality. Since tourists are co-creators of value, their opinions are of great importance for the destination to have more satisfied tourists. Data can be used for quality improvement, managing tourists expectations and higher overall satisfaction. An important result is that tourists at both destinations believe that they get a high value for money and they are satisfied with the destination as a whole.

Conclusions

The conclusion is that the satisfaction level of tourists at two studied ski destinations in Sweden is quite high and similar. This study has found key attributes such as for instance that tourists do more than just ski, and that they are overall satisfied with most of the factors. The results can and should be used as a first step to find more knowledge about what tourists prefer in order to give them experience that is fulfilling. It is of great importance that destinations address the attributes that would make tourists a more satisfied customer so that they would return to the destination in the future.

The result of this study can be used by destination planners in the ski destinations in order to improve performance in the factors important for tourists but which have low performance. Other destinations could conduct similar studies to gain knowledge regarding their tourists and their perspectives on tourism. The most important aspect to take into account in this processes is the recognition of a distinction of various attributes from the consumers' perception and producers' performance. The service quality of destinations is a key factor in differentiating service products as well as building a competitive advantage in tourism. For destinations, the IPA is a method that can be easily understood but at the same time statistically valid. One of the major benefits of using IPA is the identification of factors for service quality improvement (Hudson, Shephard, 2008).

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Analiza IPA (importance-performance analysis) destynacji narciarskich w Szwecji – porównanie między dwiema destynacjami

Słowa kluczowe: turystyka, rozwój turystyki, analiza IPA (importance-performance analysis), destynacja narciarska

Streszczenie. Celem zaprezentowanych w artykule wyników było zbadanie poziomu zadowolenia turystów biorąc pod uwagę różne czynniki w dwóch ośrodkach narciarskich w Szwecji, celem znalezienia kluczowych cech, które mogą przyczynić się do rozwoju turystyki w regionie. W destynacjach turystycznych turyści są współtwórcami wartości, dlatego ważne jest uwzględnienie ich opinii. Dane zebrano za pomocą kwestionariuszy ilościowych składających się z 40 czynników w skali Likerta od 1 do 6. Kwestionariusz rozdano i otrzymano od 373 turystów w wybranych destynacjach narciarskich. Dla większości atrybutów wyniki wskazują, że turyści są zadowoleni z usług świadczonych przez usługodawców turystycznych w miejscu docelowym. W każdej z destynacji istnieje pięć atrybutów, które wymagają dalszego rozwoju, aby poprawić ogólne wrażenia z miejsca docelowego. Wyniki badań mogą być wykorzystane przez dostawców produktów turystycznych w celu rozwoju destynacji przez rozwiązanie problemów poruszanych przez turystów. Jest to nie tylko ważne dla turystów z doświadczeniem narciarskim, ale także dla innych atrakcji i ofert w miejscu docelowym, które przyczynią się do ogólnego doświadczenia usługobiorcy.

Citation

Sörensson, A. (2017). Importance-Performance Analysis of Ski Destinations in Sweden – Comparison between Two Destinations. *Marketing i Zarządzanie*, 4 (50), 53–72. DOI: 10.18276/pzfm.2017.50-04.

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Reasons behind Studying Tourism and Recreation and Career Plans of Undergraduate Students

JEL codes: I25, J24

Keywords: reasons, choosing fields of study, satisfaction with studies, career plans

Summary. The aim of the study was to determine the reasons behind studying and career plans of undergraduate students of tourism and recreation at the University of Bydgoszcz. For the statistical inference, the incidence of features and the chi-square test for independence were used. 136 respondents (69% women and 31% men) were chosen by non-probability sampling. The analysis of relations between the year of studies and the reasons behind choosing that field of study showed a statistically significant difference in terms of expectations of 1st-, 2nd- and 3rd-year students for an interesting job ($p = 0.033$). Statistically significant relationships among students of various years were found in terms to their plans for growth opportunities in the tourism sector ($p = 0.028$). An important reason behind choosing tourism and recreation was a prospect of running one's own business in the area. Career plans and future work in the recreation sector motivated the 2nd- and 3rd-year students to believe that they would hypothetically select that field of study again.

Introduction

Motivation is a force that determines human behavior and affects people's decisions. The word "motivation" comes from the Latin verb *movere*, i.e. "to move", "to push". In the literature, one can find many various attempts to pinpoint the term "motivation". It is a concept with many different meanings, with a very broad and imprecise interpretation (Kacprzak-Biernacka, Skura-Madziąła, Kopański, Brukwicka, Lishchynskyy, Mazurek, 2014). In this paper, motivation is defined as a process which produces, directs and sustains certain human behavior amongst other alternative forms of behavior in order to achieve certain goals.

The terms "motivation" and "motive" are often used interchangeably. Obuchowski (1993, p. 4) notes that often no distinction is made between "motive" and "motivation", using only "motivation". Motive creates a feeling of justification to take up certain action. Moreover, it impacts changes of decisions of an individual in the course to reaching their target. Thus, it plays a regulatory function, involving the adaptation of forms of activities to the changing requirements, so that certain standard or an established state of affairs can be achieved.

In this paper a broad understanding of motivating and motives was used (i.e. attempts to reach one's goals). Given Poland's labor market situation, which is also a result of opening up of borders and possibility to work in other countries of the European Union, it is interesting to determine motivation of students who take up higher education. Asking for reasons behind seeking higher education is synonymous with asking for value of education in today's world.

Some authors of scientific papers (Korpysa, 2008) relate motivation to entrepreneurial attitudes and interpersonal skills (De Carolis, Saporito, 2006; Krueger, Brazeal, 1994; Paczyńska-Jędrycka, Łubkowska, Jońca, 2015). Others state that willingness to pursue higher education is a symptom of entrepreneurial mindset (Haczek, Kłos, 2012; Klimkowska, 2014). One can distinguish a wide variety of conditions and determinants that influence the decision of completing higher education. According to some researchers, decision to study is related to the choice of a particular field of study. This decision determines not only the educational path of a young person, but also – to a large extent – their choice of profession (Buchta, Skiert, 2008). Motivation to act, learn and deepen one's knowledge and the ability to determine one's interest (Buchta, Skiert, 2009; Haczek, Kłos, 2012; Radzińska, Nowak, Nowak, 2016a) and, consequently, select the field of study which agrees with one's interests, determines the academic success (Haczek, Kłos, 2012; Jarecki, 2008).

Research in this area has been conducted in Poland since the 1970s. At that time, the most important motivation for studying was by far deepening one's knowledge and professional prospects. Third place was occupied by the prestige of higher education (Liberska, 1974). Interesting research on this subject was

conducted by Jarecki (2008). His results showed that over the years the motivation of students has changed. Previously, the main reason behind choosing higher education was development of one's interests, while now pragmatic considerations are dominant, i.e. promising job prospects. The same author underlines that there is wide variation between the motives and their importance in the selection of various fields of study.

Nowadays, young people plan their careers in various ways. Young Poles, just like their peers in more developed countries, consider career in terms of developmental challenges and the basic tasks attributable to this period of life – which is the transition to adulthood and gaining independence.

For many years, higher education sector has witnessed a growing number of universities, both public and private. Unprecedented number of young people decided to take up higher education. Recent years, however, have brought a slowdown of this process due to the demographic decline. From 2010, a gradual slowdown was recorded, and the number of students in public and private schools decreased (Łubkowska, Eider, 2014; Skiert, Buchta, 2014).

The subject matter of this paper concerns the field of Tourism and Recreation (hereinafter: T&R). Forecasts saying that universities will feel the effects of demographic decline until 2025 are also valid for T&R. In recent years, a number of students who commenced their T&R studies has visibly declined. This situation forces universities to seek ways to promote their courses and systematically adapt to expectations of students.

The aim of this study was to determine the reasons behind studying and career plans of undergraduate students of Tourism and Recreation at the University of Bydgoszcz.

Material and methods

The results of this study constitute a portion of a project on evaluation of education quality at Tourism and Recreation faculties, offered by two universities: Kazimierz Wielki University in Bydgoszcz (Department of Physical Education, Health and Tourism) (Szark-Eckardt, Augustyńska, Łubkowska, Nowak, 2017) and the University of Szczecin (Faculty of Physical Culture and Health Promotion) (Łubkowska, Nadobnik, Tarnowski, Nowak, 2017; Nadobnik, Tarnowski, Nowak, 2017).

The study, which was conducted in June 2016, covered 136 full-time undergraduate students of Tourism and Recreation at the University of Bydgoszcz. The group consisted of 69% of women and 31% of men. Slightly over 22% of students came from rural areas, while nearly 78% reported urban origin. Almost 17% of students from rural areas were female, while 5.2% of the total were male. In urban environments, the share of female students amounted to 51.5% of the

respondents, while the share of male students was 25.9% of the total. The structure of the surveyed population of young people, carried out according to the criterion of the year of study, showed that 29.4% of all respondents were 1st-year students, 30.9% of them were 2nd-year students, while 39.7% of them were 3rd-year students. Analysis of affluence of the student families by place of residence did not show statistically significant differences. Most of the respondents (51.5%) rated the financial situation of their family as “very good”. Among students living permanently in the countryside, 54.8% of them considered the situation of the family as “very good”. Similar declarations were made by 50.5% of students living in cities. No “bad” or “very bad” financial situations were reported. Positive assessment of financial situation of students’ families may indicate a relatively favorable financial situation of the families.

In the research, the method of diagnostic survey was used which incorporated auditorium questionnaire, uncategorized interview and document analysis. The primary research tool was a questionnaire prepared by Nowak (Szark-Eckardt, et al., 2017). Empirical data was analyzed statistically using SPSS 23 (IBM USA). Characteristics of the distribution of responses were established, as well as significance of differences on the basis of the chi-square test for independence. Statistically significant indicators had to meet the condition of $p \leq 0.05$.

Results

The analysis of motivation for studying Tourism and Recreation took into account the fact that the study was retrospective. The following question was asked: How do students of various years perceive their choice and continuation of Tourism and Recreation studies, given their participation in the classes? The results are shown in Table 1.

Passion for travel and desire to explore the world were reported by 76.5% of respondents. Year of study did not differentiate the answers to a significant level.

While analyzing the choice and continuation of education by students of various years, influenced by their participation in the classes, a statistically significant difference was determined in the motives of 1st-, 2nd- and 3rd-year students in terms of prospects for an interesting job ($p = 0.033$). Among all respondents, 54.5% indicated this factor as an important motive. Prospects of an interesting job motivated most often 1st- and 2nd- year students (65 and 61.9%, respectively). Among 3rd-year students, this motive seemed to lose its importance (40.7%). Hence, this motive tended to weaken among students of subsequent years. Statistically significant relationships among students of various years were found, which were related to their plans for growth opportunities in the tourism sector ($p = 0.028$). This motive was important for 34.6% of respondents. Development opportunities in the tourism industry were an important selection criterion mainly for 2nd-year students (50%). It was evaluated much lower by students of the 1st and 3rd year.

Table 1

The motives for the choice of the course and commencing studies at the faculty of tourism and recreation (chi-square test of independence χ^2)

Motives	Year of study					p for χ^2
	I (n = 40)	II (n = 42)	III (n = 54)	total		
	%			n	%	
Passion for travel and desire to explore the world	87.5	76.2	68.5	104	76.5	0.100
Prospects of an interesting job*	65.0	61.9	40.7	74	54.4	0.033
Prospects of working in a tourist facility	55.0	50.0	44.4	67	49.3	0.595
Interest in physical recreation	42.5	47.6	46.3	62	45.6	0.889
Belief in attractiveness of this field of study	32.5	45.2	38.9	53	39.0	0.497
Prospects of working in a recreational facility	45.0	45.2	29.6	53	39.0	0.193
Growth opportunities in the tourism sector*	32.5	50.0	24.1	47	34.6	0.028
Opportunity to run own tourism business	42.5	35.7	22.2	44	32.4	0.099
Desire to promote a healthy lifestyle through active recreation	35.0	35.7	27.8	44	32.4	0.650
Own experience of international travel	32.5	38.1	20.4	40	29.4	0.147
Need to complete any higher education at all	22.5	35.7	24.1	37	27.2	0.325
Predisposition to work with people	30.0	31.0	20.4	36	26.5	0.423
Own experience of domestic travel	27.5	28.6	22.2	35	25.7	0.744
Belief that getting into university and studying is not difficult	17.5	31.0	25.9	34	25.0	0.365
Opportunity to run own recreation business	22.5	23.8	11.1	25	18.4	0.204
Practicing qualified tourism	22.5	21.4	7.4	22	16.2	0.078
Willingness to work in other tourist and recreational institutions	17.5	14.3	13	20	14.7	0.852
Lower cost of living compared to other cities	10.0	19.0	14.8	20	14.7	0.513
Influence of friends, acquaintances, parents	10.0	7.1	11.1	13	9.6	0.801
Belief in high social prestige of this profession	10.0	7.1	5.6	10	7.4	0.715

* Statistical significance for the motives: prospects of an interesting job ($p = 0.033$); growth opportunities in the tourism sector ($p = 0.028$).

Source: author's own research.

Statistically significant relationships among students of different years were found, which were related to their plans for growth opportunities in the tourism sector ($p = 0.028$). This motive was important for 34.6% of respondents. Development opportunities in the tourism industry were an important selection criterion mainly for 2nd-year students (50%). It was evaluated much lower by students of the 1st and 3rd year. On average, every third 1st-year student and only one in four 3rd-year student reported this motive as important (Table 1).

Working in the tourism sector and interest in physical recreation were important reasons to choose and study Tourism and Recreation (49.3 and 45.6%, respectively), but they did not differentiate various years of students. Almost every third respondent's decision was influenced by a desire to promote healthy lifestyle through active recreation, as well as a chance to run their own business in the field of tourism (32.4% each). Belief in growth opportunities in the industry varied by year of study (42.5, 35.7 and 22.2%, respectively), but was statistically insignificant. Predisposition to work with people and experience in travelling abroad were least important for 3rd-year students. Among all respondents, the need to obtain *any* higher education diploma and belief in the attractiveness of studies was reported by every third student (27.2 and 39%, respectively). Meanwhile, every fourth respondent (25%) was motivated by easy access and simplicity of curriculum. High prestige of the profession motivated few respondents (7.4%) (Table 1).

Satisfaction with studies (Table 2) was expressed mainly by students of the third year whose choice and continuation of that particular field of study was motivated by sports: practicing qualified tourism ($p = 0.006$), interest in physical recreation ($p = 0.029$), and career-oriented plans – working in the recreation sector ($p = 0.026$).

Table 2

The motives for choosing the field of study and commencing studies, satisfaction with the studies and a declaration of choosing this faculty again* (Chi-squared test χ^2)

Motives	Satisfaction with studies (year of study)			Declaration of choosing the faculty again (year)		
	1 st year	2 nd year	3 rd year	1 st year	2 nd year	3 rd year
Work in the recreation sector			0.026			
Interest in physical recreation			0.029			
Desire to promote a healthy lifestyle through active recreation						0.038
Practicing qualified tourism			0.006			
Own tourist experience - abroad				0.045		

* For improved clarity, the table contains only those variables and values which differentiated respondents' opinions to a statistically significant extent.

Source: author's own research.

For the third-year students who were satisfied with their studies, external motives – friends' persuasion – were important ($p = 0.040$). Only 1st-year students expressed satisfaction with their studies and declared choosing them again ($p = 0.006$ and $p = 0.040$, respectively). Choosing the same field of study again by 1st-year was motivated by professional consideration – their own experience of travelling abroad ($p = 0.045$). The same field of study would be hypothetically

selected again by 3rd-year students who were motivated by the desire to promote a healthy way of life through active recreation ($p = 0.038$) (Table 2).

Table 3 presents an analysis of professional expectations of students of various years. Most respondents would like to work in the recreation sector (53%).

Table 3

Career plans of the students of tourism and recreation considering the year of study
(Chi-squared test χ^2)

Career plans	Year of study			Total	
	I (n = 40)	II (n = 42)	III (n = 54)	n	%
	%				
In a tourist facility	57.5	57.1	46.0	72	53.0
In a recreational facility	45.0	54.8	48.1	67	49.3
In a holiday resort*	45.0	66.7	33.3	64	47.1
I am planning to stay abroad for a while to earn some money	40.0	38.1	25.9	40	29.4
In another profession related to physical education	30.0	35.7	20.4	38	27.9
In other institutions related to tourism and recreation	27.5	19.0	14.8	27	19.9
I am planning to complete another supplementary education	27.5	26.2	14.8	24	17.6
I would like to work in tourism and/or, but I don't see any job opportunities*	2.5	9.5	27.8	20	14.7
I am planning to go and stay abroad permanently	15.0	9.5	9.3	15	11.0
A profession not related to tourism or recreation	5.0	11.9	13.0	14	10.3
I haven't decided yet	7.5	9.5	9.3	12	8.8

* Statistical significance (planning a job in a holiday resort – $p = 0.005$ for test χ^2 ; planning a job in tourism and/or recreation, but there are no job opportunities – $p = 0.001$ for test χ^2).

Source: author's own research.

There was a statistically significant difference between years of study and plans to work in tourist resorts ($p = 0.005$). Willingness to work in a resort was expressed by almost half of the respondents (47.1%). Future career in resorts was the most popular among 2nd-year students (66.7%). The least interested in working in a resort were students of the third year (33.3%). Proportion of 3rd-year students declaring such career plans was lower by 50% in comparison to 2nd-year students.

1st- and 2nd-year students who planned their career in the industry assessed prospects of employment quite pessimistically (2.5 and 9.5%, respectively). 3rd-year students were a little more optimistic (27.8%). One in three students planned a temporary stay abroad to earn money (29.4%). On average, every 10th student wanted to work in a profession unrelated to tourism, planned to

permanently live abroad or did not decide on their career plans (10.3, 11.0 and 8.8%, respectively).

Based on the results from Table 4, statistically significant relationships were found between planning career in the tourism sector by 1st-, 2nd- and 3rd-year students and their career-oriented motivation – desire to work in the tourism sector ($p = 0.000$).

Table 4

Relations between the reasons for studying and career plans* (Chi-squared test)

Motives	Career plans					
	tourism sector			recreation sector		
	1 st year	2 nd year	3 rd year	1 st year	2 nd year	3 rd year
Prospects of an interesting job	0.041					
Prospects of work in the tourism sector	0.001	0.000	0.001			
Prospects of work in the recreation sector				0.000	0.000	0.000
Willingness to work in other institutions					0.043	
Interest in physical recreation	0.002	0.001		0.005	0.002	0.000
Desire to promote a healthy lifestyle through active recreation		0.020			0.014	0.004
Own experience of domestic travel					0.014	
Own experience of international travel						
Opportunity to develop own tourism business	0.037	0.026		0.019		0.013
Opportunity to develop own recreation business	0.015	0.047			0.010	0.007
Conviction of high prestige of the profession						
Major growth opportunities in the tourism sector					0.030	

* For improved clarity of the results, the table contains only those variables and values which were statistically significant.

Source: author's own research.

1st- and 2nd-year students who planned their career in the tourism sector were motivated by their interest in physical recreation ($p = 0.002$ and $p = 0.001$, respectively) and prospects of running their own business in the tourism sector ($p = 0.037$ and $p = 0.026$, respectively) and recreation sector ($p = 0.015$ and $p = 0.047$, respectively). For students of 1st to 3rd year who planned career in recreation sector, choice of the field of study was motivated by their interest in physical recreation ($p = 0.005$, $p = 0.002$ and $p = 0.000$, respectively) and career in the recreation

sector ($p = 0.000$, $p = 0.000$ and $p = 0.000$, respectively). 2nd- and 3rd-year students who wanted a career in the recreation sector, listed career-oriented reasons behind choosing that particular field of study: desire to promote a healthy way of life through active recreation ($p = 0.014$ and $p = 0.004$, respectively), and prospects of running their own business in the recreation sector ($p = 0.010$ and $p = 0.007$, respectively). 2nd-year students were also motivated by career-oriented factors: great growth prospects in the tourism industry ($p = 0.030$), their own experience in domestic travel ($p = 0.014$), their belief in the attractiveness of the field of study ($p = 0.004$), as well as autotelic desire to work in other institutions ($p = 0.043$) (Table 4).

It has been shown that 1st-, 2nd- and 3rd- year students who planned their career in another profession related to physical culture were motivated by the following career-oriented factors: career in the recreation sector ($p = 0.000$, $p = 0.006$ and $p = 0.000$, respectively), interest in physical recreation ($p = 0.000$, $p = 0.002$ and $p = 0.008$, respectively) and desire to promote healthy lifestyle ($p = 0.043$, $p = 0.014$ and $p = 0.026$, respectively). Additionally, 2nd-year students interested in working in another profession related to physical education, chose the discussed field of study based on their own experience in domestic travel ($p = 0.002$) and foreign travel ($p = 0.002$), prospects of running their own business in the recreation sector ($p = 0.010$) and major growth opportunities in the tourism industry ($p = 0.024$). Meanwhile, 3rd-year students who wanted to work in another profession related to physical culture highlighted their belief in high prestige of the profession, interesting job opportunities and running their own recreation business as career-oriented motives ($p = 0.040$, $p = 0.016$ and $p = 0.003$, respectively).

Results related to career plans versus satisfaction from the studies are presented in Table 5.

Table 5

Career plans of students versus their satisfaction with studies* (Chi-squared test)

Career plans	Satisfaction			Choosing the faculty again		
	1 st year	2 nd year	3 rd year	1 st year	2 nd year	3 rd year
Work in a recreation facility		0.050	0.037		0.007	0.023
Work in other tourism related institutions			0.024			
Work related to physical education			0.009			

* For improved clarity of the results, the table contains only those variables and values which were statistically significant.

Source: author's own research.

Career plans related to working in recreation sector ($p = 0.037$), other institutions related to tourism ($p = 0.024$) and physical education ($p = 0.009$) influenced

3rd-year students' satisfaction with studies to a significant extent. 2nd-year students who planned career in the recreation sector also expressed satisfaction with their studies ($p = 0.050$). Future career in the recreation sector motivated the 2nd- and 3rd-year students to believe that they would hypothetically select that field of study again ($p = 0.007$ and $p = 0.023$, respectively).

Figure 1 presents employment prospects after graduation according to subjects.

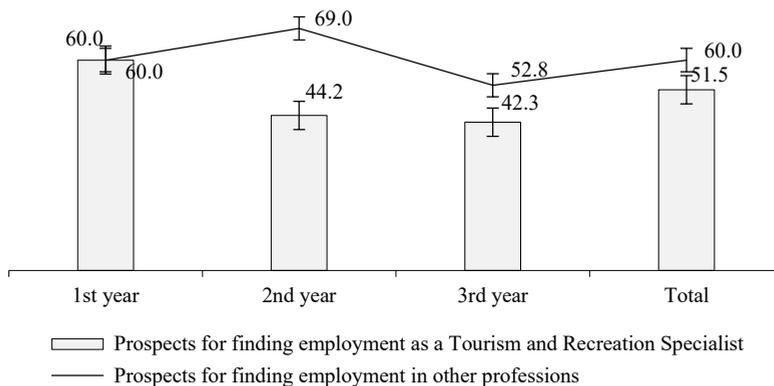


Figure 1. Employment prospects after graduation according to subjects (Chi-squared test)

Source: author's own research.

Assessment of career prospects in the field of Tourism and Recreation depended significantly on the year of studies ($p = 0.046$). 51.5% of subjects described prospects for finding employment as a Tourism and Recreation specialist as "average". There was a tendency to reduce belief in job opportunities with every successive year of study (10.0, 14.3 and 36.5%, respectively). Every fifth subject (21.6%) described prospects for finding employment as a Tourism and Recreation specialist as "poor". 23.9% of subjects described prospects for finding employment as a Tourism and Recreation specialist as "good", including 30% of 1st-year students, 26.2% of 2nd-year students and 17.3% of 3rd-year students. Thus, the lower year of studies, the more optimistic assessment of finding a job in the tourism industry.

Chances for finding a job in another profession were assessed similarly by students of all years. Every third respondent rated the chances of finding a job in another profession as "good" and "very good" (29.6%); 3rd-year students gave that answer most frequently (35%).

Assessment of satisfaction with studies among students of various years showed no statistically significant difference. Majority of students were satisfied

with a chosen field of study (high and very high ratings accounted for 77.2% of responses). Students of all years reported a similar number of high and very high ratings 80, 83 and 70%, respectively. Only every twentieth respondent was not satisfied with their studies. “Low” and “very low” ratings accounted for 5.1% of responses and were given by 2nd- and 3rd-year students (2.3 and 11.1%, respectively).

Despite the overall satisfaction with the studies, majority of subjects (79.7%) were uncertain about choosing (hypothetically) the field again. That uncertainty was declared mostly by 3rd-year students (81.5%), while 1st- and 2nd-year students were less apt to give that response (30 and 32%, respectively). Only 16.7% were determined to choose Tourism and Recreation again; only 9.3% of 3rd-year students declared such hypothetical decision, compared to twice as many 1st- and 2nd-year students (21.1 and 22%, respectively).

Discussion

Factors that impact our choices of a particular profession should be primarily: interest and passions (De Clercq, Honig, Martin, 2013; Vallerand et al., 2007). Ideally, by developing our interests, we can combine them with skills that improve job performance (Jarecki, 2008).

The study unveiled motives behind choosing Tourism and Recreation by undergraduate students at Kazimierz Wielki University in Bydgoszcz. The research showed two main reasons: development of one’s interests (76.5%) and promising job prospects (54.4%). Prospects of an interesting job motivated most often 1st- and 2nd-year students. When choosing a field of study, these young people were motivated mostly by their interests, despite the prospective low wages in professions related to tourism and recreation.

Notably, the dominant motive behind choosing that particular field of studies was “romantic” and included also subsequent years of students. Passion for travel and desire to explore the world often stemmed from adventure novels and family stories. Perhaps that was the reason why fulfilling a dream of long journeys was so strongly reflected in students’ responses. Although the passion was probably not as strong as described by a famous reporter and globetrotter Ryszard Kapuściński who said that “there is such a thing as being infected with travel and it is an incurable disease.” Nevertheless, the belief that choosing that field of study facilitates traveling and learning about the world is certainly justified.

Confrontation of the obtained results with results of surveys conducted among students of the same major at the Faculty of Physical Education in Biała Podlaska showed significant convergence. Choosing undergraduate Tourism and Recreation studies, respondents were motivated mostly by their interests and attractiveness of the studies (Buchta, Skiert, 2008), while the graduate/Master’s students were motivated by interests and career-oriented goals (Buchta, Skiert, 2009).

In the study of Jarecki, based on an analysis of data from the Central Statistical Office from 2004 (which included a sample of approximately 4,000 households, students and graduates), different motivations were discovered (Jarecki, 2008). For people aged 30 and younger who studied and graduated, the most important motive to study was pragmatic – a chance to find a good job (almost 69%). Development of one's interests was listed as the second reason (over 61% of subjects). The same study found that there were significant differences between the motivation of students from different fields. Better chances for a good job was the most important motive for Architecture and Construction students (over 82%), as well as Economics and Administration (almost 80%), while it was the least important for students of Agriculture, Forestry, Fishery (35%) and Education/Pedagogics (over 37%). As for the second motive (i.e. personal interests), the largest proportion was discovered among Medicine students (100% of respondents made such declarations), Education/Pedagogics (approximately 83%) and Engineering and Technical (almost 72%). The smallest proportion of subjects chose their studies according to their interests in fields such as Economics and Administration (approx. 55%), Agriculture, Forestry and Fishery (60%). It would be interesting to continue the research on the effects of higher education on e.g. performance, remuneration and job satisfaction when the field of study was convergent and divergent with one's interests.

Another important reason to choose a particular field of studies indicated by the respondents was a belief in the attractiveness of that field (39% of subjects). These results correspond to the data analysis performed by other authors (Buchta, 2012; Radzińska, Nowak, Nowak, 2016a; Skiert, Buchta, 2014).

When starting to study of Tourism and Recreation, 34.6% of respondents were motivated by their plans associated with significant growth potential of the tourism industry and their willingness to run their own business in the tourism sector. Unfortunately, along the way students tended to lose their belief in possibility of running their own business in the industry (42.5%, 35.7% and 22.2%, respectively).

Interesting results were obtained in research carried out at the Off-Campus Faculty of Physical Education in Gorzów Wielkopolski, Tourism and Recreation. It revealed that "freshman" students paid particular attention to good preparation for the labor market in institutions connected directly with their field of study. These students also demonstrated great interest in running their own businesses (Radzińska, Nowak, Nowak, 2016a).

These results correspond to the current situation in the tourism industry, which has witnessed dynamic growth in recent decades. Tourist labor market has been leading the world in terms of generating workplaces. Tourism-based economy is an important market segment which employs 8.9% of all employed people in the world (*Travel & Tourism Economic Impact*, 2014). The role of this sector in

the Polish economy is much humbler but constantly growing. Employment in the tourism sector in 2013 amounted to 5.1% of all employed Poles (Seweryn, 2015).

This study revealed that students are infrequently motivated by belief in high prestige of the profession (over 7%). This is a puzzling result since the choice of future profession should take into account the aspect of prestige as a component of satisfying and fulfilling career. It may result from observations of the labor market in the tourism industry, which does not offer satisfactory earnings, although one can certainly list other occupations where wages are at a much lower level (nurses or salespeople). This situation should be food for thought for universities which educate tourism industry personnel, especially given the fact that every year the tourist services market in Poland expands. The results of previously mentioned Jarecki's research differ from the results of this study. An important motive for choosing the studies was the social prestige of being a graduate (approx. 27%) (Jarecki, 2008).

Research of other authors on the prestige of teaching profession showed results similar to those obtained in this work – these motives were listed with least frequency (Radzińska, Nowak, Nowak, 2016a).

In this study, satisfaction with studies was expressed mainly by students of the third year whose choice of that particular field of study was motivated by sports: practicing qualified tourism, interest in physical recreation, and career-related plans – working in the recreation sector, as well as external motivations, such as being persuaded by friends. Other authors obtained data similar to those presented in this paper. The vast majority of students of Tourism and Recreation at the Off-Campus Faculty of Physical Education of Warsaw Academy of Physical Education in Biała Podlaska expressed satisfaction with their course and declared a hypothetical willingness to choose it again [9] – similarly to 96% of subjects at the Faculty of Physical Education in Biała Podlaska (Buchta, 2010) and over 83% of students from the Off-Campus Faculty of Physical Culture in Gorzów Wielkopolski (Radzińska, Nowak, Nowak, 2016b).

The highest proportion of students satisfied with their choice was observed in the fields of Medicine (93.1%), while significantly lower satisfaction level was reported by students of Nursing (66.9%) (Kropiwnicka, Orzechowska, Cholewska, Krajewska-Kułak, 2011).

In author's own study, majority of students (53%) declared willingness to work in the recreation sector. The year of study significantly differentiated answers about the declared willingness to work in the tourism industry, while at the same time the subjects lacked belief in such possibility. The higher the year of study, the more negative assessment of employment prospects in the industry among students who wished to work in the industry. As a confirmation of this pessimistic view, one in three students planned a temporary stay abroad to earn money (29.4%). Diminishing employment opportunities despite willingness to work in

the profession seem to be a visible trend. It justifies plans of staying temporarily abroad of one third of students, while every tenth student intends to work outside tourism industry: live abroad permanently or have not decided about their professional future yet.

Jarecki (2008) noticed that – marginal at the time but visible now – the phenomenon of choosing field of studies which facilitates working abroad. Similarly, research by Radzińska et al. (2016b) showed that 38.9% of subjects planned to go abroad due to limited chances of finding a job as a Physical Education teacher.

Expanding the subject group in the future would allow for further verification of these observations. Exploring reasons behind studying in the context of professional goals and monitoring careers of Tourism and Recreation graduates seem crucial both for the students (who will become potential employees in the industry), as well as for potential candidates for students (professional and industry applications, practical preparation for working in the industry).

Conclusions

1. Students of Tourism and Recreation reported great passion for travel and prospects of an interesting job as their dominant motivation for this field of study.
2. An important reason behind choosing Tourism and Recreation was a prospect of running one's own business in the area.
3. Majority of subjects described prospects for finding employment as a Tourism and Recreation specialist as "average". There was a tendency to reduce the belief in job opportunities in successive years of study.
4. Professional plans and future work in a recreational unit motivated the 2nd- and 3rd-year students to believe that they would hypothetically select this field of study again.
5. In order to meet the expectations of students, it is extremely important to adapt the curriculum of Tourism and Recreation courses to the actual needs of the modern economy.

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Motywy studiowania i plany zawodowe studentów turystyki i rekreacji pierwszego stopnia

Słowa kluczowe: motywacje, wybór kierunków studiów, zadowolenie ze studiów, plany zawodowe

Streszczenie. Celem artykułu było określenie motywów studiowania oraz poznanie planów zawodowych studentów turystyki i rekreacji pierwszego stopnia na Uniwersytecie Kazimierza Wielkiego w Bydgoszczy. Zastosowano kwestionariusz ankietowy własnego autorstwa. We wnioskowaniu statystycznym posłużono się frekwencją cech oraz testem niezależności chi-kwadrat. Celowym doбором objęto 136 respondentów (69% kobiet i 31% mężczyzn). Analiza wpływu roku studiów na motywy wyboru kierunku studiów wykazała istotną statystycznie różnicę w oczekiwaniach studentów I, II i III roku w zakresie perspektywy ciekawej pracy ($p = 0,033$). Stwierdzono statystycznie istotne zależności wśród studentów poszczególnych lat w planach związanych z dużymi możliwościami rozwoju w branży turystycznej ($p = 0,028$). Ważnym motywem podjęcia studiów i studiowania na kierunku turystyka i rekreacji była możliwość rozwijania samodzielnej działalności gospodarczej w tej dziedzinie. Prozawodowe motywy studiowania i wiązanie swojej przyszłości zawodowej z pracą w jednostce rekreacyjnej determinowały przekonanie o ewentualnym ponownym wyborze studiów studentów II oraz III roku. Wychodząc naprzeciw oczekiwaniom studentów, niezwykle ważne jest dostosowanie programów nauczania na kierunkach turystyki i rekreacji do potrzeb współczesnej gospodarki.

Citation

Szark-Eckardt, M., Augustyńska, B., Łubkowska, W. (2017). Reasons behind Studying Tourism and Recreation and Career Plans of Undergraduate Students. *Marketing i Zarządzanie*, 4 (50), 73–88. DOI: 10.18276/pzfm.2017.50-05.

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A Public Management Framework for Wireless Broadband Development in Rural Sub-Saharan Africa

JEL codes: O18, R53, P43, H7

Keywords: public management, new public management, PPP, rural broadband, management framework

Summary. This paper identifies potential public and private stakeholders needed to help rural communities deliver wireless broadband infrastructure in sub-Saharan Africa. These rural areas are not commercially viable for mobile broadband cellular networks. However, few rural communities in the region have attempted to develop Wi-Fi networks. Few have succeeded and some have failed. A public Public-Private Partnership framework that can be customized to deliver and provide sustenance to these initiatives may hold the answer to curb the failure of such initiatives. This study adopts the stakeholder theory of identification and salience on 6 community-based initiatives in developed and developing countries to find out different stakeholder arrangements in these cases. Based on the findings, the interpretive phenomenological analysis is used to explain how the findings could be utilized by the public sector agencies in Africa to help rural communities develop sustainable Wi-Fi networks. The paper concludes that a triangular relationship between the community, the public sector agency, and attractive incentives for each stakeholder, can serve as the basis for organizing such stakeholders to aid the community develop the networks.

Introduction

This paper presents a Public Private Partnership stakeholder management framework aimed at facilitating wireless broadband internet infrastructure projects in rural areas of sub-Saharan Africa. This framework is necessitated by the fact that rural communities in sub-Saharan Africa are making attempts to provide affordable broadband internet infrastructure for themselves. In most cases, the rural communities are spurred to embark on this venture by local and foreign non-governmental organizations. Examples of such initiatives include, the Macha Works in Zambia, the numerous wireless user groups in South Africa, Bosco network in Uganda, the Ghana wireless Project, to mention just a few (Nungu, Brown, Pehrson, 2011; Williams, 2015; Rey-Morano, Graaf, 2016). Most of these initiatives are Wi-Fi networks, spurred by the affordability of Wi-Fi equipment, the potential for non-orthodox deployment possibilities of the network and the deregulation of the Wi-Fi spectrum in most sub-Saharan African countries.

Unfortunately, few of these initiatives have not been sustainable. An example of such, the Ghana Wireless project, is mentioned in this report. This is mainly because the operators of these networks lack the resources and capacity to economically manage the network. However, the operators have acquired the technical skills to manage the technical aspects of the network (see case of Cape Town WUG – Rey-Morano, Graaf, 2016). As a result of this possibility, they are able to raise volunteers who provide technical support for the network. They also embark on knowledge transfer processes to transfer the knowledge from one volunteer to another.

In order for these initiatives to succeed and become sustainable in sub-Saharan Africa, these communities need technical and knowledge base, as well as financial and organizational support. These forms of support can be provided by one or more groups of stakeholders. Such stakeholders include public sector agencies, NGOs, donor agencies, and the private broadband service providers. However, the interest of the stakeholder will depend on the expected reward (incentives) it will derive from being a partner with the community to develop the Wi-Fi infrastructure. Therefore, the questions this paper seeks to address are: Which stakeholders should collaborate with local communities to develop Wi-Fi infrastructure in rural areas in sub-Saharan Africa? What should be the responsibilities of the stakeholders in this partnership? What should be the role of the community in this partnership?

In order to answer these questions, a research was conducted by the author of this paper to identify a Public Private Interplay (PPI) Framework that would enable the delivery of broadband infrastructure in rural areas in developing countries (Williams, 2015). The findings in this research had global implications but as a form of disseminating the results of this research, the findings is

contextualized towards sub-Saharan Africa. These findings provide an insight towards answering these questions. The earlier research the author conducted was on six cases of broadband development that involved either community cooperatives or NGOs. These were the Magnolia Road Internet Coop (MRIC) (the USA), Djurslandsnet (Denmark), Almhult Municipal Broadband (Sweden), Johannesburg Wireless User Group (South Africa), Dharamsala Wireless network (owned by Airjaldi) India, and the Ghana Wireless Project (Ghana). All of the cases, except for that of Sweden, deployed Wi-Fi networks. Fibreoptic connections were used in the Swedish case. The essence of studying this case was to identify the relationship between different stakeholders and communities which are organized to develop rural broadband infrastructure. Based on the lessons learnt, guided by the research questions in this paper, inspiration can be extracted on their responsibilities; incentives; their potentials as core stakeholders and the potential role of communities in developing broadband networks. Three of the cases are cases of developing countries and the other three concern developed countries. The reason for studying developing countries is the need for a different sources of inspiration on potential organizational partnership arrangements of the stakeholders.

This paper has been written from an interpretivist's perspective. The stakeholder theory of identification and salience is used to present the findings for the cases. Based on this presentation, the definitive (core or direct) stakeholders and the indirect (expectant) stakeholders are identified for each case. Their responsibilities and incentives for being part of the partnership are identified. The interpretive phenomenological analysis is used as an analytical tool to simulate and present the PPP stakeholder framework for rural broadband infrastructure development based on the findings from the stakeholder theory of identification and salience. The paper concludes that the framework presented can be used to deliver broadband infrastructure using Wi-Fi in rural areas with chronic broadband deficiency. The reservation is that it should be owned by communities. It also concludes that the existence of an extensive fibreoptic backbone network presents an opportunity for forming such partnerships to develop such networks. It further calls on governments in sub-Saharan Africa to adopt innovative ways of fostering these stakeholder relationships in their jurisdiction to aid communities develop Wi-Fi networks.

The paper has been divided into 8 sections. Section 1 is the introduction; Section 2 explains the relationship between PPP frameworks the stakeholder theory of identification and salience; Section 3 presents the methodology of the research; Section 4 presents the overview the cases; Section 5 explains the findings from stakeholder theory of identification and salience, Section 6 presents the PPP stakeholder framework; Section 8 is the discussion and section 9 is the conclusion of the paper.

A review of PPP frameworks and the stakeholder theory of identification and salience

An introduction of PPPs and how they are adopted in the delivery of telecom infrastructure and an overview of the stakeholder theory of identification and salience followed by the relationship between PPP frameworks and the stakeholder theory of identification and salience.

Subsection I: PPPs and telecom infrastructure development in Sub-Saharan Africa

A PPP is a synergic partnership that involves in most cases a consortia of public and private partners or stakeholders in a project. A stakeholder implies a group or entity that can have an influence on the activities of an organization or, in this case, a project (Freeman, 1984). PPP projects are often proposed by the manager (often a public entity). The central stakeholder or project manager in the context of this paper designs and provides investment guidelines, the timeframe, and other terms for implementing the project. Different stakeholders, based on the proportionate allocation of risks, resources and rewards are invited to join the project by the project manager (Jamali, 2004). The invitation is often based on their perceived capacity and experience in facilitating similar projects.

In modern times, PPPs were contracted via long term concessions or lease agreements (Worldbank, 2014). The aim was to attract private investment and management expertise in developing public infrastructure (Hearne, 2009; Savas, 2000). PPP concession business models included the variations of the Build-Operate-Transfer (BOT), Design-Build-Finance-Manage-Operate (DBFM), Design-Build-Operate (DBO) and other Public Financial Initiative (PFI) business models (Williams, Falch, 2012; The World Bank, 2011). The private sector often forms a consortium to leverage their competences to participate in the projects (EPEC, 2012). An example of an involvement of a consortium in telecom network infrastructure is the case of NBNco (Australia) (Bedi, Brown, Gasser, Wanjau, Webb, 2016).

Today, the need for PPPs is driven by the desire to facilitate the supply of broadband and Next Generation Networks (Kushida, 2013; Feijoo, Gomez-Barroso, Bohlin, 2011). This desire has led to the public sector to:

1. Co-finance PPPs: Examples of publicly funded PPP initiatives include the Singapore Next Generation Nationwide Broadband Network, the RAIN Project in Lithuania, and broadband developments in Sweden, the Netherlands, Japan, etc. to mention a few (Yardley, 2012; Kushida, 2013; Lindskog, Johansson, 2005; Sadowski, Nucciarelli, de Rooij, 2009).
2. Allow new stakeholders to become part of PPPs: Traditional telecom PPP stakeholders were public organizations and telecom network operators. Tele-

com operators often led a consortium consisting of partner network operators, banks, donor agencies and other economic and managerial stakeholders (EPEC, 2012; Worldbank, 2014). In recent times, other stakeholders including municipalities, civil society groups and housing cooperatives have been visible players. Examples of such cases can be seen in the United States and in specific EU countries, such as the Netherlands, Denmark, Sweden and the UK to mention a few (Williams, 2015; Sadowski, Nucciarelli, de Rooij, 2009; Tapia, Maitland, Stone, 2006). In the global South this has not been the case, and although civil society groups have been involved in facilitating networks, they have not been partners in a PPP.

This new approach was facilitated on the foundation of older and evolving PPP business models. In the EU, Africa and Asia, the popular PPP Business models used for facilitating telecommunication infrastructure include variations of the DBO aimed at facilitating NGNs (Williams, 2015). This includes Private DBO and Public DBO business models. The private DBO implies the private sector retaining ownership of the network (Yardley, 2012). The network may or may not involve public funding. Examples include the mobile infrastructure project in the UK, InfraCo (Nigeria) and National Broadband Initiative in Malaysia (Bedi et al., 2016). The public DBO implies public funding and ownership of the network while the private sector is contracted to manage it (Yardley, 2012). Examples include the National ICT Backbone (Tanzania), Western Cape Government Broadband in South Africa and Metropolitan Area network in Ireland (Bedi et al., 2016).

Subsection II: Overview of the theory of stakeholder identification and salience

The dynamic nature of PPP business models makes room for more creative business models that can aid rural broadband development in the global South. The dynamics can be modified using the theory of stakeholder identification and salience. The theory provides an insight into how managers can identify stakeholders worth prioritizing for specific objectives (or projects in our case) (Mitchell, Agle, Wood, 1997). Mitchell, Agle and Wood (1997) present three characteristics of stakeholders. These are stakeholders with power, stakeholders that require urgency and stakeholders that are legitimate (ibid). Power is the ability a social actor possesses to get another social actor to perform an action (Foucault, 1982). Urgency implies “the degree for which a stakeholder’s claim call for immediate action” (Mitchell, Agle, Wood, 1997). Legitimacy implies “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed systems of norms, values, beliefs and definitions” (Mitchell, Agle, Wood, 1997).

Different stakeholders possess one or more of these characteristics. And these characteristics determine the type of the stakeholder as seen in Table 1 below.

Table 1

Stakeholder typology based on the theory of stakeholder identification and salience

Type of stakeholder	Stakeholder characteristic	Class of stakeholder	Salience
1. Any	power, legitimacy, urgency	definitive	high
2. Dominant	power, legitimacy	expectant	moderate
3. Dangerous	power, urgency		
4. Dependent	legitimacy, urgency		
5. Dormant	power	latent	little or none
6. Demanding	legitimacy		
7. Discretionary	urgency		
8. Non-stakeholder	none	none	none

Source: Mitchell, Agle, Wood, 1997.

The stakeholders of interest to the manager are the definitive stakeholders. This is because they possess power, urgency and legitimacy – hence they have high salience. There are other stakeholders whose salience is moderate. They possess any of the two stakeholder characteristics. The central manager views them as expectant stakeholders (Mitchell, Agle, Wood, 1997). Mitchell, Agle and Wood (1997) explain that they always expect something. The manager sees a potential in them but does not grant them the same priority as the definitive stakeholder. The stakeholder of little or no interest to the manager is the latent stakeholder (ibid). It possess only one stakeholder characteristic. If an entity possesses none of the three characteristics, then it is not a stakeholder.

Subsection III: PPPs and the theory of stakeholder identification and salience

The organization and financial arrangements of PPPs can be viewed in the light of the theory of stakeholder identification and salience. This is because PPPs in general, be it concessions or lease agreements, are designed for stakeholders relevant for the project. The relevance denotes the importance of the stakeholder to the project. This is evident in the delivery of telecommunications infrastructure in Africa, from the International Gateway to the last mile networks.

In facilitating international Gateways, notable PPPs in Africa are the EASSy the TEAMS and the SEAS projects (Williams, Falch, 2014; EU Africa Infrastructura Trust Fund, 2016). The EASSy project was transnational, while the TEAMS and SEAS project were initiatives led by the Kenyan Government (Williams, Falch, 2014). The important stakeholders for these projects were the public (government agencies) and the private sector (network operators, banks and international development agencies).

At the national level in Africa, the prevalent mode of facilitating national and last mile infrastructure is by promoting a competitive market. However, in Africa PPPs are also adopted in the facilitation of fibreoptic backbone infrastructure. These are private and Public DBOs. An example of a public DBO is the National ICT Backbone in Tanzania (Bedi et al., 2016). An example of a private DBO is InfraCo in Nigeria, the Kenya LTE and the Eastern Corridor project in Ghana (ibid). In addition to facilitating fibreoptic backbones at the national level, Universal Service Funds in Africa use PPPs to facilitate mobile and fixed backbone infrastructure. Examples of such initiatives can be found in Uganda, Ghana, Sudan and Nigeria (ITU, 2013). Rural areas are often the target of these Universal Service Fund initiatives. These PPPs are Public DBOs and Private DBOs. For public DBOs, the network operator's capital expenditure is greatly reduced as the public sector leases its microwave towers to the network operator to deliver and manage their services. In the case of a Private DBO, the Universality Fund, such as USPF (Nigeria), co-finances the private sector's network infrastructure development (Williams, 2015). There are also municipal and regional governments' efforts in South Africa where municipalities utilize Public DBO to connect schools, public buildings and government offices (Bedi et al., 2016). Here Wi-Fi networks and fibreoptic networks are used in the Isizwe Municipality and Western Cape Government initiatives respectively (ibid).

There are no known last-mile PPP initiatives in sub-Saharan Africa. The important stakeholders for the PPP initiatives were the public sector (Universal Service Funds, regulators, and government agencies) and the private sector (network operators).

The public sector agency serves as the manager. In the case of the Private DBOs in Nigeria, this is still the case as the USPF and the regulator, the NCC, often leads the initiative. Using the theory of stakeholder identification and salience, the stakeholders with high salience are those who bear the risks, provide resources and earn the rewards from the project. In Africa, as identified earlier, these are a mix of both public and private stakeholders. Public stakeholders include public agencies that provide governance to the project and public agencies that actually join private SPVs to invest into the project. An example is the TEAMS and EASSy projects. Private stakeholders include network operators, financing institutions and international development partners. Each of these public and private stakeholders earn different rewards based on their agreed percentage in the project or the SPV they belong to. The public sector agency providing governance may earn indirect benefits via the provision of universal access for the infrastructure. It is important to note that this assessment is based on the current PPP and previous PPP efforts in telecom infrastructure delivery in Africa. It is not reflective of all PPPs.

Stakeholders with moderate salience identified in PPPs in Africa are interest groups. These groups do not earn, provide resources or bear the risks of the

project. However, they will indirectly earn the reward of being connected. They are expectant stakeholders. They could be dangerous stakeholders who lack legitimacy but they have the power to disrupt the project. These are civil society groups who feel that the project disturbs the agenda they promote. They could be dominant stakeholders with power and legitimacy who feel aggrieved by the project. These are network operators not involved in the project but who feel the project is discriminatory. They could stall the project with a court case. They could be dependent stakeholders who are legitimate but who lack power and urgency. The best example is of this is the subscriber or the end user. The telecom service is for them but they cannot influence decisions regarding the delivery of the service to them.

However, the possibility a PPP provides, using the theory of stakeholder identification and salience, is that the Manager decides which stakeholder has high or low salience for a project. This is evident in a telecom related PPP as there is no universal PPP arrangement or business model. Different stakeholders are granted salience based on the importance given to them by the manager. This offers the possibility of producing bottom-up PPP initiatives as well, as will be seen later. However, new stakeholders that should be granted high salience are communities and groups of people. Communities in different parts of the world, including Africa, have exhibited a potential to facilitate telecom and broadband infrastructure in the right regulatory and financial environment. These cases have been studied and documented by the following authors, among others (Hudson, 2014; Kakekaspan, O'Donnell, Beaton, Walmark, Gibson, 2014; Salemin, Bosworth, 2014; Williams, 2015). What is important though is how different African countries and possibly developing countries define the scope of such projects, allocate resources, risks and rewards to the communities invited into PPPs.

In the next section, what was learnt from the six cases studied and an explanation of the PPP model will be explained. Furthermore, how this form of PPP could aid Wi-Fi over fibreoptic in rural areas to provide data rates of 2Mbps and above is explained. Though the model was developed under a much elaborate work, these six cases provide an insight into the possibilities of the model.

Methodology

The methodology outlined only applies to an aspect of the bigger research being disseminated here. This aspect of the research was a multi-case study. The process began with a 'how' research question. Cases that would reveal the "how" were selected via a combination of purposive sampling and the snow ball sampling technique. 6 cases were selected because there was a feedback from contact persons from these cases during the duration of the research. The cases are mentioned in Table 2.

Table 2

The cases studied

Case	Country
1. Djurslandsnet	Denmark
2. Almhult Municipality Broadband	Sweden
3. Magnolia Road Internet Cooperation (MRIC)	United States
4. Johannesburg Wireless User Group (JAWUG)	South Africa
5. AirJaldi	India
6. Ghana Wireless Project	Ghana

Source: Williams, 2015.

The cases with no feedback were suspended for future research. In the main research, a semi-structured interview guided by the actor network theory and the stakeholder theory was administered. The results presented in this paper are those derived from the stakeholder theory of identification and salience and aspects of the unstructured part of the interviews. The semi-structured approach was used to elicit additional information that may not have been catered for in the theory. The bulk of the interviews can be accessed in the main research (see ref). The interviews were administered to 9 respondents. These were the municipality officer in charge of the Swedish project, the former chairman and volunteer of Djurslandsnet, the chairmen of Airjaldi and JAWUG and a board member of Magnolia Road Internet Coop. Face-to-face interviews were conducted with the respondents from Denmark and Sweden. Skype video interviews were conducted with respondents from India, Ghana and South Africa. Multiple exchange of documents and follow up questions via emails was conducted with 2 board members from the MRIC USA. The interviews used for this aspect of the research were analysed using narrative analysis. But in this paper, interpretive phenomenological analysis is used. The idea is to provide a first person point of view of how the perceived interpretations of the findings in this research can help solve the challenge tackled in this paper. The analysis is made in an explanatory manner. The explanation provides an overview to the cases. It also highlighted the various stakeholders in each case, the functions of the stakeholders, their responsibilities, their incentives and how they collaborate to develop the broadband infrastructure. Based on the outcome of the research, a report is generated for each case. This is followed by a cross synthesis on the outcome of each case aimed at identifying definitive stakeholders, expectant stakeholders and latent stakeholders. In this design, a definitive stakeholder is indispensable to the PPP project. An expectant stakeholder is not indispensable but necessary. A latent stakeholder is highly dispensable. Based on the outcome of the cross-synthesis, an argument is made for why a member of a sub-class of stakeholders should be indispensable to

the development of a PPP project for developing rural broadband in sub-Saharan Africa. This forms the bases for introducing the PPP framework.

Overview of the cases

In previous attempts to disseminate the aspects of this research, the background of the cases has been described in detail (Williams, 2015). The emphasis in this description is on stakeholders, their responsibilities, their incentives and how they collaborate.

Subsection I: Djurslandsnet

This network has evolved into 10 distinct networks. They share the same network infrastructure but they are owned by 10 different communities. In 2005, when the network was created, it was originally a single Wi-Fi networkmesh owned by residents of the Djursland peninsula in Denmark. Connectivity to their Wireless Access Network (WAN) was provided by a regional fibreoptic network. The peninsula is home to about 80, 000 people. It is mostly a rural agriculture and fishing community with few semi-urban areas. They were compelled to deploy this network because broadband providers did not find the area commercially viable. The community received an EU subsidy to help them offset 50% of their cost once the installation process ended. The network is sustained by income from annual membership fees and monthly access fees. The network is maintained by volunteers. The initial organizational setup comprised a central committee of democratically elected representatives who oversaw 8 sub-committees representing the 8 communities in the peninsular. In 2010, the network evolved to the sub-committees becoming independent but sharing the same network.

Subsection II: Almhult Municipality Broadband

This is a municipal initiative in Sweden. The aim was to offer communities their own FTTH access networks. Almhult is an area that the dominant FTTH operator TeliaSonera did not find commercially viable. The municipality had to design a Public Private Partnership framework involving the municipality, a private infrastructure and service provider, and the local communities in the municipality. The municipal representatives were compelled to embark on this project because they had an existing fibreoptic network that interlinked their outstations. The infrastructure was in close proximity to the residents in rural areas. Based on this opportunity, the municipality secured funding for the project, they procured an infrastructure provider, Zitius with a platform provider, quad-racom to Design, Build and Operate the FTTH on its behalf for three years. The municipality also encouraged the formation of cooperatives in local parishes and 9 of them were formed. EU funding was facilitated by the municipality to help

the co-ops in providing ducts for the fibreoptic. The co-ops also raised money by charging for FTTH access to the household of their members and charging an annual membership fee among other charges. Nine cooperatives were raised. Installations have been made and a lot of homes in Almhult have access to FTTH via this initiative. The takeaway from this case is that communities can be supported and enabled to own broadband infrastructure with the aid of an innovative public sector initiative.

Subsection III: Magnolia Road Internet Coop

This is one of many community-based broadband initiatives in the United States. The initiative was started by residents of Magnolia who were in need of broadband internet services. Magnolia road is located in a mountainous region and the population density is low. However, the entrance of new ISPs to the area led the neighbours to think of a way of extending connectivity to most residents in the area, with the ISPs providing the bandwidth. Inspired by the possibility of being funded by the state of Colorado, the neighbours formed a cooperative called Magnolia road Internet Coop. Using their personal resources, they performed trials as a proof of concept to their neighbours, using events such as pot luck etc. to advertise themselves. This activity paid off overtime, as their volunteer base grew so did their attempt to create backhaul networks by themselves. Once they had a clear proof of concept they were able to convince neighbours to sign up to the coop to gain access to the network. The network was governed by the democratically elected members of the cooperatives. The network still exists today having about 400 members.

Subsection IV: Johannesburg Wireless User Group

JAWUG is one of the many community networks in South Africa. In 2001, the cost of broadband connection in South Africa at the turn of the century was exorbitant. A group of computer science students, living within a neighbourhood in Johannesburg, had the need to collaborate remotely for academic reasons and to play games online. They needed a broadband connection with the capacity to meet their needs. Using their allowances, they purchased routers and antennas to connect their homes using the unlicensed Wi-Fi spectrum (2.4 GHz – 5.8 GHz). Bandwidth was provided via an existing broadband connection to their homes. Based on their technical knowledge of setting up a radio equipment, they did set up network successfully. Other neighbours saw the need for having free network with enhanced data rates compared to the existing data rates. The ad-hoc network had no form of organization, it was operated by volunteers. This network extended through most parts of the eastern Johannesburg. Before 2006, other smaller networks in Johannesburg decided to merge their network with the network established by these students. In 2006, this unorganized confederation of networks led by the

network built by the students was named as Johannesburg Wireless User Group (JAWUG). A critical factor for this network is the provision of free bandwidth by ISPs. Unfortunately they cannot interconnect with Public Switched Telephone Network (PSTN), as it is not permitted by law in South Africa.

Subsection V: Airjaldi

This is a social enterprise that grew out of the Dharamsala wireless network in India. At present social enterprise owns a set of 4 wireless meshes. The social enterprise began as an NGO facilitated by Yahel Ben David, an IT expert and an entrepreneur. He moved to Dharamsala with his family with the sole aim of developing a broadband network for the community. The only access to the Internet in rural Dharamsala was via V-sat owned by a few NGOs. He accessed bandwidth from a nearby town to Dharamsala where he developed a wireless mesh from his own resources. He had help from volunteers from the western world visiting the area at different intervals. His aim was to connect anchor tenants such as orphanages, schools, local NGOs and other anchor tenants. He could not commercialize the network because the Wi-Fi spectrum in India then was not licensed. The deregulation of the Wi-Fi spectrum occurred in 2006. Coincidentally, there was a conference in Dharamsala to compare notes on various rural wireless broadband initiatives. The conference attracted investors who found commercial value in the network and invested in it. The NGO was converted to a social enterprise which serves rural Dharamsala until today.

Subsection VI: Ghana Wireless Project

Ghana Wireless project was a project in the eastern region of Ghana initiated by CbLit, an NGO in Ghana. The aim was to deliver broadband to residents of the Akuapim ridge. The NGO was inspired by personal effort of a Peace Corps member, John Atkinson, from the United States. He used his resources to facilitate a proof of concept. He redistributed a bandwidth from the V-sat using a wireless Wi-Fi mesh to few households. Based on the proof of concept the NGO decided to commercialize the network. 1 MB was purchased from an NCS, an ISP and then redistributed to 20 customers. The decline of the network occurred when the 512Kbps was not enough for the needs of the user. Users here adopted more of OTT entertainment and communication services. This led to the degradation of the Quality of Experience (QoE) of the customer which resulted in the loss of customers and the eventual closure of the initiative. Had it had similar resources as the other cases, it would have succeeded. Their network could not succeed due to lack of resources and degraded bandwidth. There were challenges in capacity building and amassing more users. This is where a PPP would have helped.

Subsection VII: Lessons derived from the case descriptions

Broadband infrastructure ownership, deployment and management by communities: in the developed economies, communities own, deploy, operate and manage their individual broadband networks. In the developing countries being an object of study - apart from South Africa - community participation in broadband infrastructure development is low. In India, a social enterprise had to manage the network. In Ghana, an NGO had to manage the network.

The possibility for capacity building to facilitate sustained supply: one could easily conclude that it is not a wise idea for communities or in sub-Saharan Africa to deploy broadband networks. But that would be a hasty and false conclusion and it would stifle innovative delivery of broadband networks. Basically, one could have said so about the Swedish case. FTTH is an expensive network technology to be deployed. People living in Swedish communities are not trained to manage FTTH networks. They do not have the resources to manage such networks. But the municipality made a conscious decision to provide capacity building for the cooperatives and sources for funding the project, as well as to develop a business model for the collaboration and to supervise the initiative. In sub-Saharan Africa, public sector agencies can also adopt innovative initiatives aimed at involving the communities in developing affordable wireless broadband infrastructure for rural areas. Currently, there are organized groups and rural social structures (such as village/traditional councils) with whom public sector agencies could partner. In the Ghana wireless project, if the effort of the NGO was supported by relevant public agencies, it would have survived.

Preference for Wi-Fi: the second take away from the findings is the utilization of Wi-Fi as the wireless broadband access technology of choice aside FTTH. Wi-Fi is adopted because it is cheaper to deploy and some aspects of the equipment can be locally fabricated (Williams, 2015). The technology operates in an unlicensed band and it can deliver data rates beyond 54mbps at 5.7 GHz and 2.4 GHz frequency bands (Carter, Lahjouji, McNeil, 2003). At 2.4 GHz band, Wi-Fi transmission spans a greater coverage area of about 250 feet to 400 feet in closed spaces. This enables point-to-point and point-to-multi-point mesh backbone networks (Carter, Lahjouji, McNeil, 2003). Also it is a much cheaper broadband technology to deploy as compared to other wireless broadband technologies. These are possible reasons why Wi-Fi was chosen.

Based on these lessons, one needs a collaborative effort between the public sector, private sector the non-profit (civil society and communities) to develop a PPP arrangement for delivering broadband infrastructure in rural areas. In the next section, the stakeholder theory of identification and salience are applied to identify the responsibilities, as well as the incentives needed to develop the collaboration.

Findings from Stakeholder Theory of Identification and Salience

Subsection I: Stakeholder identification

In the cases studied, there were stakeholders who were directly involved in the broadband projects and those who had an indirect influence on the broadband projects. The direct stakeholders based on the description in the previous section are listed in Table 3.

Table 3

Direct stakeholders

Case	Country	Stakeholder group			Type of broadband network
		public	private	non-profit	
1. Djurslandsnet	Denmark	No	Access network provider	Cooperative organization	Wi-Fi mesh
2. Almhult broadband network	Sweden	Almhult Municipality	Zitius/ Quadracom	9 parish cooperative organizations	Fiber to the home (FTTH)
3. Magnolia Road Internet Coop	USA	No	Private ISPs**	Neighbourhood cooperative	Wi-Fi mesh
4. Airjaldi	India	No	Social enterprise	Group of volunteers	Wi-Fi mesh
5. JAWUG*	South Africa	No	Private ISPs	Neighbourhood cooperative	Wi-Fi mesh
6. Ghana wireless project	Ghana	No	Private ISP	Non-governmental organization	Wi-Fi mesh

* Johannesburg Wireless User Group.

** Internet Service Providers.

Source: Williams, 2015.

These direct stakeholders based on the stakeholder theory of identification and salience were definite stakeholders for each project. They were granted power, legitimacy, and urgency granted by owners of the project who in most cases constituted the community. In the Swedish case, the owner of the project was the municipality. However, it is important to note that apart from the communities; NGOs etc., the only remaining constant definitive stakeholders are the ISPs which provide bandwidth to these networks. This implies that communities, NGOs can always collaborate with ISPs to extend connectivity from the ISPs network via the community network to rural households. In sub-Saharan Africa, rural communities may not be able to make these deals. So they will definitely need the assistance and guidance of a relevant public sector agency such as the telecoms regulator, etc.

Table 4 identifies indirect stakeholders. These stakeholders are expectant stakeholders for various projects. In some cases, they were meant to be definitive stakeholders. It was because they possessed the power to influence the project and were legitimate participants for the project.

Table 4

Indirect stakeholders

Case	Country	Stakeholder group			Type of broadband network
		public	private	non-profit	
1. Djurslandsnet	Denmark	Danish government, European Union	No	Danish Business Authority,	Wi-Fi network mesh
2. Almhultbroadband network	Sweden	European Union via Kroneberg county,	Duct diggers	No	Fiber to the home (FTTH)
3. Magnolia Road Internet Coop	USA	State of Colorado	No	Informal pot luck gatherings	Wi-Fi mesh
4. Airjaldi	India	Government of India	No	No	Wi-Fi mesh
5. JAWUG*	South Africa	No	No	No	Wi-Fi mesh
6. Ghana wireless project	Ghana	No	No	No	Wi-Fi mesh

Source: Williams, 2015.

However, the projects could proceed without them or without their direct influence. As an example, Djurslandsnet did not have direct support of the Danish government. But Danish government permitted cooperatives. MRIC could not secure funding from the state of Colorado, yet the project was delivered by the coops.

What the indirect stakeholder needs in order to become a direct stakeholder is to be granted a sense of urgency by the designers of the project. This implies that they are seen as indispensable. Based on this premise, one can easily shift these stakeholders around depending on the incentives and responsibilities made available for the stakeholders in the PPP arrangement.

Subsection II: Stakeholder incentive

Direct stakeholders: each stakeholder group in each of the cases studied had similar incentives. The public sector stakeholders were interested in achieving universal access to their chosen broadband technology. The private sector group

was interested in making profit. The non-profit group was interested in the availability of affordable broadband infrastructure in their locality.

Indirect stakeholders: the incentives to participate in the project or otherwise for each stakeholder group were not similar. In the Danish case, the Danish government had no incentive to participate in the initiative. The Danish government adopted the market based approach, so telecom infrastructure development was an affair for the market. The Danish business authority also had no incentive to participate in the project. They did not see the project as viable. They are mentioned because they were approached and identified as a stakeholder by the cooperative (Williams, 2015). However, the EU did participate in the project, as the EU has a policy of providing assistance in order to extend broadband infrastructure to areas where the market forces cannot cater for. In the Swedish case, the indirect stakeholders had incentives to provide peripheral support to the project. The EU also offered support for the project without participating directly in the project. The reasons were the same as in the Danish case. The diggers had the opportunity of being remunerated. In the case of the US, the state of Colorado had the incentive to fund universal service. However, the total cost of the project was USD 13,000.00, i.e. less than minimum subsidy requirement of the state amounting to USD 100,000.00. The organizers of the potluck were incentivised because they would have more participants at their event. In the South African case, there was no incentive at that time in order to provide aid to such groups by the government of South Africa. Situation was similar in the case of Ghana and India.

The possibility of a stakeholder being transferred from an indirect stakeholder to a direct stakeholder is incentive dependent. Therefore, it is possible to enhance incentives to enable indirect stakeholders become direct stakeholders. But this will depend on the designer of the collaborative framework.

Subsection III: Stakeholder's responsibility

The responsibility of each stakeholder group in each case is represented in Table 5.

For all the cases except Sweden, the public sector's significant responsibility was the governance of the market. The significant act of governance was deregulation of the Wi-Fi spectrum. In the Swedish case, the public sector was involved in the design, planning, implementation, building and providing governance for the project. The role of the private sector in some cases has been passive, except for the cases of Sweden and India. In the Swedish case, the private sector operates and manages the municipal infrastructure. In India, the private sector actually owns the infrastructure. However, the role of the non-profit stakeholder is significant. Here they finance, own, build, design, operate and maintain the network. Communities, as mentioned earlier had to take matters into their hands to implement an affordable broadband network for themselves.

Table 5

Stakeholder responsibility

Case	Public sector responsibility	Private sector responsibility	Non-profit
Denmark (Djurs-landsnet)	Financing via EU funding. Deregulation of Wi-Fi spectrum by Danish government	Provision of bandwidth	Coop financing. Infrastructure design. Infrastructure building. Infrastructure implementation. Infrastructure maintenance. Infrastructure operation
Sweden (Almhult municipality/ Zitius/ Hallaryd coop)	Municipality funding EU funding. Regulation for public funding. Infrastructure design. Backhaul building. Backhaul implementation	Private sector infrastructure outsourcing. Private sector infrastructure maintenance. Private sector infrastructure operation	Coop financing. Coop access network design. Coop access network building. Coop access network implementation. Coop access network operation. Coop access network maintenance
India (Airjaldi)	Market reforms aimed at lowering market entry barriers. Deregulation of Wi-Fi spectrum	Private infrastructure financing. Private infrastructure design. Private infrastructure building. Private infrastructure implementation. Private infrastructure operation	Initial network design, infrastructure building. Infrastructure financing
USA (Magnolia Road Internet Coop)	Public financing if the project is worth a minimum of \$100,000. Deregulation of Wi-Fi spectrum		Coop financing. Coop network design. Coop network building. Coop network implementation. Coop network operation. Coop network maintenance
South Africa (Johannesburg Wireless User Group)	Deregulation of Wi-Fi spectrum		Coop financing. Coop network design. Coop network building. Coop network implementation. Coop network operation. Coop network maintenance
Ghana Wireless Ghana Project	Deregulation of Wi-Fi spectrum		NGO financing. NGO network design. Coop network building. Coop network implementation. Coop network operation. Coop network maintenance

Source: Williams, 2015.

However in sub-Saharan Africa, one would be expecting too much, if rural areas were expected to build a network. But they can be made to partially contribute financially on a long term basis, as well as to help in the construction and most importantly to own the networks through community groupings under the supervision of a public sector agency. Maintenance and the operations of the network can be outsourced to a private sector entity for a limited period under the supervision of a public sector agency. Next section explains how this could be done.

PPP stakeholder framework

Based on the findings, the analysis is conducted using the perspective of an interpretivist, similar stakeholders, their incentives and thus the responsibilities can be identified. This process is not a copy-paste model, rather it is based on the fact that similar direct stakeholders exist in sub-Saharan Africa. It is also based on the fact that rural communities and NGOs in sub-Saharan Africa make some form of an attempt to facilitate broadband connectivity in their locality. Examples of such initiatives include Macha works in Zambia, Bosco Uganda, etc, mentioned earlier in the introduction. If that is the case, using the inspiration from the cases studied a collaborative PPP framework can be suggested to help such communities and many others to deliver Wi-Fi over fibre optic networks. Potential stakeholders, their incentive and responsibilities are as follows:

Subsection I: Stakeholders and their incentives

Definitive stakeholders: In rural sub-Saharan Africa, a definitive stakeholder should have a strong incentive to become a part of the project.

1. Members of non-profit stakeholder groups:

Communities, village councils, local NGOs, donors, agencies, etc.

Their incentive:

They need broadband for their constituents, locality and local initiatives respectively.

2. Members of public stakeholder groups:

National governments, regional/provincial governments, universal service funds and national network regulators.

Their incentive:

Every sub-African government has various dimensions of universal service policies in broadband policies (ITU, 2013). These policy initiatives will not be achieved if certain localities in their jurisdiction are disenfranchised from having access to an affordable broadband infrastructure. Therefore forming innovative partnerships to deliver affordable broadband infrastructure is of importance to these group of stakeholders.

3. Members of private sector stakeholder groups:

Internet network and service providers.

Their incentive:

They do not have a strong incentive to join the partnership. But they would not mind earning additional income from community networks accessing their networks. They would also not mind providing technical assistance to communities. This opportunity presents a low market entry and exit barriers for them. In order to lower the market entry and exit barrier further, this paper proposes that the infrastructure be owned by the community.

Based on this framework, the study proposes a three way relationship between the public, private and non-profit stakeholder groups with the identified members as preferred definitive stakeholders as seen in Figure 1. This Figure is extracted from the main research, based on the analysis explained here.

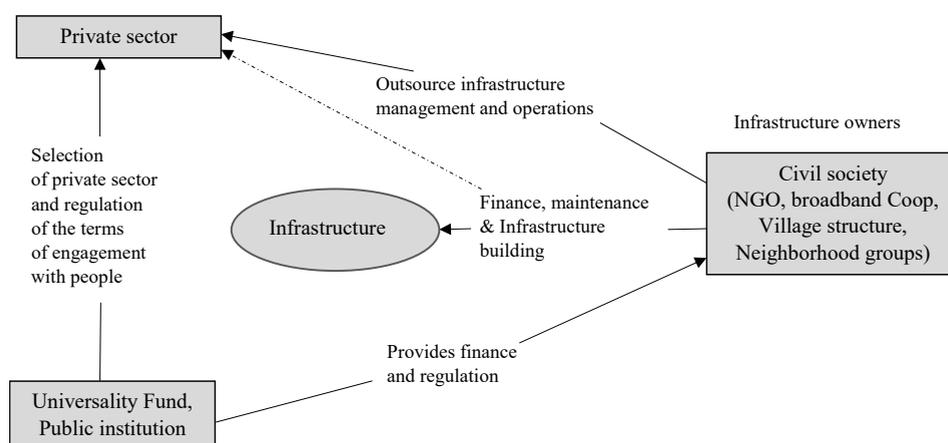


Figure 1. PPP framework for Rural Broadband Development

Source: Williams, 2015.

The expectant stakeholders: this stakeholder group consists of relevant national and regional stakeholders who do not have direct influence on the project, even though they have the power to stop the project. These stakeholders also do not have the incentives to be directly involved in the project. These stakeholders could be a bank (especially if money was borrowed), public regulatory agencies and competing network operators, etc. Some other stakeholders could be stakeholders who must be solely informed. Examples include civil society groups, pressure groups, etc. For the definitive stakeholders to function unhindered, the relevant expectant stakeholders should be identified and changed management processes

should be implemented by the designers of the project. However, expectant stakeholders who will contribute directly to the project should be elevated to become a definitive stakeholder in the project by granting the stakeholder either power, legitimacy or urgency depending on the deficiency of the stakeholder. As an example a stakeholder may be needed for this project. But the national law does not allow the stakeholder to be involved in the delivery of any telecom infrastructure. For this project to be implemented, laws have to be enacted to enable that stakeholder to participate in the project.

Subsection II: Potential responsibility of the identified direct stakeholders

In Figure 1 above potential responsibilities of each class of stakeholder are outlined. They are as follows:

1. Public stakeholder: the primary responsibility of public stakeholders should be to protect the community network. They design in collaboration with the community to build the network, finance the network with the community and monitor network sustainability. They have to do so by serving as a proxy between the private sector stakeholder and the community. In order to fulfil their task they have to do the following:
 - a) regulate the terms of engagement for the project for each stakeholder;
 - b) allocate responsibilities in the project by deciding which stakeholders should be involved;
 - c) allocate ownership of the infrastructure for the community;
 - d) develop a favourable business plan for the community or outsource management of the infrastructure to the private sector on behalf of the community;
 - e) facilitate capacity building for the delivery of certain aspects of the infrastructure by the community;
 - f) facilitate capacity building;
 - g) identify and source for funding to subsidize greatly the cost of the project for the community. This could be done via soft loans;
 - h) partially fund the project if necessary;
 - i) provide the risk allocation for the project including regulatory risk, political risk, technological risk, commercial risk, fiscal risk, etc.;
 - j) identify potential conflict regulatory mechanisms needed for the project. These suggestions are inspired by the role of the municipality in the Swedish case.
2. Non-profit stakeholders: they own the infrastructure. If they have the competences, they can design, build, manage, operate, maintain and finance the network. If they do not have the competences, they can either be trained by the public sector or outsource the building, operations, management and mainte-

nance of the infrastructure to the private sector. What is also recommended for this group is that they have to contribute to the co-funding of the project. This will provide a sense of ownership for the project as well.

3. The Private sector group: private sector group in this case does not own the network. They can assist to build, manage, operate and maintain the network in cases where groups of people cannot do so. This happens if the public sector entity or group of people decide to engage them. If they are to be engaged, that can be done in a form of a short term lease so that people may have a choice of outsourcing to another entity, on condition that they are not satisfied with the current operator. They are not supposed to invest in the project as well. The idea here is to save the network from the desire for immediate profit. If the network becomes profitable and the private sector intends to purchase the network, on the approval of the public sector the groups can sell the network. Though this responsibility sounds variable if the greater role of the private sector is in the provision of access to their fibre optics infrastructure.

Discussion

The outcome of the interpretive analysis has an implication to broadband delivery in sub-Saharan Africa. It serves as a clarion call to rethink how broadband infrastructure is being delivered to rural areas in the region. Currently, the public sectors management approach towards broadband infrastructure delivery has been market based approach and the encouragement of technology neutrality. This approach enables governments in the region to redirect their focus to other sectors of the economy. This approach worked well with the delivery of 2G standards of mobile telecom networks. But if one takes a closer look at that phenomenon, this technology grew indeed because this technology on liberalized African market was uninterrupted for 14 years (1990–2004) (Frempong, Braimah, 2008; Skouby, Williams, 2014).

Currently rapid evolution of mobile broadband networks does not allow for the market maturity of the existing network before another is launched. Most network operators have to reconsolidate their market position in urban areas, once there is competition from a newer network provider, delivering an upgrade of the existing mobile networks. An example can be seen in the case of 3G. Though 3G market in Africa is at its infancy, 4G is already being deployed in many cities in Africa (Williams, 2015). In Ghana as an example before MTN acquired the spectrum, they had already built 400 operational 4G sites in regional capitals (MTN Ghana, 2016). In countries such as Kenya, Ivory Coast, Gabon and in some African countries, LTE has been launched (Williams, 2015; World Time Zone, 2016). This has disenfranchised rural dwellers in sub-Saharan Africa as seen in figure 2 below.

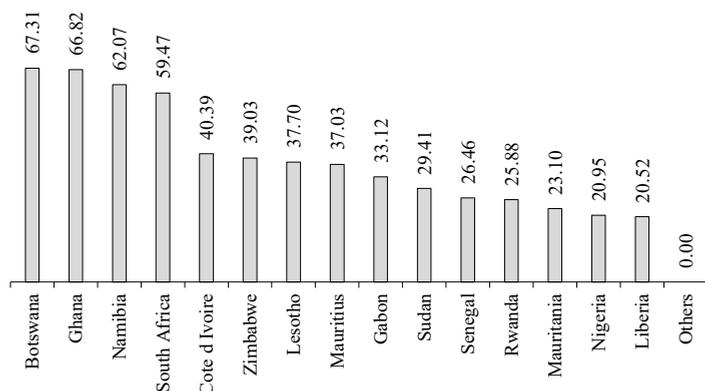


Figure 2. Mobile broadband subscription per 100 inhabitants in sub-Saharan Africa

Source: extracted from Broadband Commission, 2016.

Based on Figure 2 above, one may notice that 15 out of 49 countries in sub-Saharan Africa record mobile broadband subscription of about 20%. The estimated population of subscribers with subscription in these countries is approximately 133.2 million people. See the table below. In a region (sub-Saharan Africa) with a population of 974 million people (PRB, 2016) this is low.

This calls for a new way of thinking with respect to the delivery of broadband infrastructure in rural sub-Saharan Africa; a new thinking related to: (a) a type of broadband network that should deliver the services, (b) maintaining this infrastructure in rural areas; (c) harnessing demand for broadband in rural areas in these countries. This way of thinking should include active participation of the communities living in rural areas. In order to do so, inhabitants of this area have to feel that they own this infrastructure, they should learn to have the sense of belonging by partially investing into this infrastructure; partially building and determining its fate. The proposition of Wi-Fi over fibre optics was made because most rural initiatives in Africa utilize Wi-Fi. And Africa is now home for extensive fibre optics networks that run across villages in the process of linking two towns and regions. Therefore this is an opportunity for developing such broadband infrastructure, it is an opportunity for encouraging newer ways of delivering broadband infrastructure in rural areas. This is why this PPP framework is vital and this framework can be utilized in any rural area with the definitive stakeholders intact.

Table 6

Outlook on broadband subscription in Africa, 2016

Country	Mobile broadband subscription per 100 inhabitants*	Population**		
		national (millions)	with subscription (millions)	without subscription (millions)
Botswana	67.31	2.2	1.48082	0.71918
Ghana	66.82	28.2	18.84324	9.35676
Namibia	62.07	2.5	1.55175	0.94825
South Africa	59.47	55.7	33.12479	22.57521
Cote d' Ivoire	40.39	23.9	9.65321	14.24679
Zimbabwe	39.03	16	6.24480	9.75520
Lesotho	37.70	2.2	0.82940	1.37060
Mauritius	37.03	1.3	0.48139	0.81861
Gabon	33.12	1.8	0.59616	1.20384
Sudan	29.41	42.1	12.38161	29.71839
Senegal	26.46	14.8	3.91608	10.88392
Rwanda	25.88	11.9	3.07972	8.82028
Mauritania	23.10	4.2	0.97020	3.22980
Nigeria	20.95	186.5	39.07175	147.42825
Liberia	20.52	4.6	0.94392	3.65608
Others	0.00			
Total		397.9	133.16884	264.73116

Source: * extracted from Broadband Commission, 2016; ** PRB, 2016.

What is needed is a political will from the public sector, a sustainability plan for the initiative, a proper risk assessment and innovative ways of organizing the resources of various stakeholders by the public sector. Rural areas in sub-Saharan Africa may never be commercially viable for existing mobile network operators. But it could be commercially viable for small communities whose sustenance of the Wi-Fi network hinges on the local economic activity of the area.

The limitation of this PPP framework is that it is designed for local projects. The public agencies in sub-Saharan African countries possess finite and insufficient financial resources. However, such initiatives can be handled by universal service funds. It can also be handled by specialized agencies whose duty is to map the rural areas in their respective countries and develop the project in phases. Over time the project would have catered for the access of gap areas. Governments from sub-Saharan Africa can also look to the West to identify potential initiatives, where they could be inspired to organize such initiatives with the use of framework of this paper. A good recommendation is the broadband delivery UK initiative since it also uses framework similar to the Swedish case examined in this paper.

Conclusions

This paper aimed at identifying innovative partnerships in the West that could serve as an inspiration for delivering wireless broadband networks in rural areas of sub-Saharan Africa. Proposed network was Wi-Fi mesh interconnected with fibre optics network. Six cases, 3 from developed countries and 3 from developing countries have been analysed using the stakeholder theory of identification and salience. The theory was used to identify stakeholders that were important in the delivery of different broadband networks in above-mentioned 6 rural cases, as well as recognize their functions, responsibilities and how they collaborated with other stakeholders to deliver the infrastructure. Apart from one case, they all deployed Wi-Fi mesh networks. Three classes of stakeholders were identified. These were public, private and non-profit stakeholders. Within these group of stakeholders, using the stakeholder theory of identification and salience, communities (in the not for profit stakeholder), public sector agencies (public stakeholders) and Internet service and network service providers were identified as the definitive stakeholders. Based on these three groups and inspired by the studied cases, a triangular relationship between the stakeholders was presented alongside the responsibilities of the stakeholders.

Based on the findings, this paper concludes that developing such collaborative frameworks for developing rural broadband infrastructure in sub-Saharan Africa is possible. This is because communities are already making efforts to develop their infrastructure. Some have failed, however this network if properly planned should help mitigate the rate of failure of standalone community broadband initiative in Africa. The paper also concludes that this approach will serve as a good supplementary effort to the market based approach, which has not been successful in rural areas in the region. However, more research is needed into how specific projects in Africa can be developed out of this framework.

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Publiczne ramy zarządzania dla rozwoju bezprzewodowych łącz szeregopasmowych na obszarach wiejskich w Afryce Subsaharyjskiej

Słowa kluczowe: zarządzanie publiczne, nowe zarządzanie publiczne, PPP, łącza szeregopasmowe na obszarach wiejskich, zarządzanie

Streszczenie. W artykule dokonano identyfikacji potencjalnych publicznych i prywatnych interesariuszy potrzebnych, aby pomóc społecznościom wiejskim w dostarczaniu bezprzewodowej infrastruktury szeregopasmowej w Afryce Subsaharyjskiej. Te obszary wiejskie nie są komercyjnie opłacalne w przypadku mobilnych sieci szeregopasmowych. Jednak niewiele społeczności wiejskich w regionie próbowało rozwijać sieci wi-fi. Niewielu się udało, a niektóre z nich poniosły porażkę. Ramy partnerstwa prywatno-prywatnego, które można dostosować w celu dostarczania i zapewniania wsparcia dla tej inicjatywy mogą stanowić odpowiedź na niepowodzenie takich inicjatyw. W artykule przyjęto teorię identyfikacji interesariuszy i jej znaczenie w 6 inicjatywach społecznościowych w krajach rozwiniętych i rozwijających się, aby zidentyfikować różnorodne podejścia dotyczące interesariuszy w takich przypadkach. Bazując na uzyskanych wynikach wykorzystano interpretacyjną analizę fenomenologiczną do wyjaśnienia, w jaki sposób osiągnięte rezultaty mogą być wykorzystane przez agencje sektora publicznego w Afryce, aby pomóc społecznościom wiejskim w rozwijaniu zrównoważonych sieci wi-fi. W artykule stwierdza się, że trójkatne relacje między społecznością, agencją sektora publicznego z atrakcyjnymi zachętami dla poszczególnych zainteresowanych stron, mogą służyć jako podstawa do organizowania takich interesariuszy, aby pomóc społeczności w rozwijaniu sieci.

Citation

Williams, I., Falch, M., Tadayoni, R. (2017). A Public Management Framework for Wireless Broadband Development in Rural Sub-Saharan Africa. *Marketing i Zarządzanie*, 4 (50), 89–116. DOI: 10.18276/pzfm.2017.50-06.

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From Reactive to Predictive Services: the Internet of Things (IoT) Enabled Product Service Systems (PSS) of Innovative and Sustainable Business Model

JEL codes: L86, O3, Q01, L84

Keywords: product service systems, ICT, Internet of Things, business model

Summary. This paper aims at exploring the emergence of a new trend towards Product Service Systems (PSS) business model among manufacturing companies which are made available by ICT, with a particular focus on IoT and analytics. While PSS have been already widely researched, the impact of new ICT technologies on the value proposition which a company offers to its clients has been explored less. The Internet of Things (IoT) enabled product-service system provides opportunities to transform old business model based on a product delivery into a new business model which allows for offering new ICT based services usable with a product or even instead of a product. Leading manufacturing companies already today are making higher profits from aftermarket service. IoT sensors, Artificial Intelligence (AI) and pervasive computing can create new business opportunities for PSS solutions by delivering data about product usage and its condition to manufacturers, who as a consequence can then make use of it in order to deliver proactive and preventive maintenance. A case study of Rolls-Royce engine manufacturer is used to analyse the impact of IoT, machine learning and analytics on the company service offering and business strategies.

Introduction

This paper aims at exploring the emergence of a new trend towards Product Service Systems (PSS) of sustainable business model among manufacturing companies enabled by ICT, with a particular focus on IoT and analytics.

During the last few years, we witnessed a growing role of ICT in many industrial sectors. At an estimated \$3.9 trillion dollars, Industry 4.0 is widely recognized as the industry with the most to gain from the Industrial Internet of Things (Relayr, 2017). Industry 4.0 refers to digital transformation in manufacturing and relates to the combination of several major innovations in digital technologies, such as: artificial intelligence, IoT and sensors, cloud computing and big data analytics.

As a result of implementations of digital technologies, we can observe movement of manufacturing companies offering goods and associated services, rather than goods alone. Recently this trend has accelerated and is related not only to products with associated services, but also to a new way of handling the relationship with customers. One can observe a shift from offering value added services to offering customised mix of services where a producer maintains ownership of the product and a customer pays only for the provision of agreed results. The transition towards result-based integrated solutions resulted in the shift of focus, i.e. from the product to the functional result. This means that the client no longer buys a product but the output of the product according to the level of use.

This paper adopts methods of literature review about PSS and the case study analysis of Rolls-Royce company.

The paper is structured as follows. The next section outlines theoretical foundations in the literature on PSS and sustainable business models. Section 3 and 4 depict Internet of Things (IoT) enabled product service system (PSS), as well as describe IoT business opportunities. The following sections present real application of IoT and analytics in the case study of Roll-Royce which has employed new ICT solutions in their PSS.

Product Service Systems (PSS) - literature review

Different types of ‘value added’ product service business can be identified in literature on Product Service Systems. The first formal definition of PSS was given in 1999 (Goedkoop, Van Halen, Te Riele, Rommens, 1999) in the project of Product Service Systems, which was commissioned by the Dutch ministries of environment (VROM) and economic affairs (EZ), i.e. “a Product Service system (PS system, or product service combination) is a marketable set of products and services, jointly capable of fulfilling a client’s need”. In this publication, the authors have presented key success factors of PSS implementation, e.g.:

- a) creating value for clients by adding quality and comfort;
- b) customising offers or delivery of the offer to clients;
- c) creating new functions or making smart or unique combinations of functions;
- d) decreasing threshold of a large initial or total investment sum by sharing, leasing, and hiring;
- e) decreasing environmental load;
- f) increase the quality of contacts with clients.

As soon as the first paper by Goedkoop appeared, the number of articles on PSS grew increasingly (Baines, Lightfoot, Evans, 2007; Mahut, Dababoul, Bricogne, Eynard, 2017).

Manzini and Vezzoli (2003) defined PSS as “an innovation strategy, shifting the business focus from designing (and selling) physical products only, to designing (and selling) a system of products and services which are jointly capable of fulfilling specific client demands”.

Many researchers have presented the concept of Product Service-System (PSS) in relation to sustainability, economy and environment (Brandstotter, Haberl, Knoth, Kopacek, 2003). The above-stated authors were of the opinion that “a PSS consists of tangible products and intangible services, designed and combined so that they are jointly capable of fulfilling specific customer needs. Additionally PSS tries to reach the goals of sustainable development”.

ELIMA (ELIMA, 2005) defined a product service system as a system of products, services, supporting networks and infrastructure that is designed to be competitive, satisfy customer needs, and have a lower environmental impact than traditional business models.

There have also been various attempts to categorize diverse types of PSS arrangements. Most of the classifications proposed in the literature distinguish between three main categories. Below one can find a description of the main categories of PSS (Tukker, Tischner, 2005) that have been generally accepted by researchers in this field.

1. Product-oriented PSS:

- a business model is still mainly geared towards sales of products but some extra services are added.

2. Use-oriented PSS:

- the product does not shift in ownership. The provider has ownership, and is also often responsible for maintenance, repair and control.

3. Result-oriented PSS:

- a provider is in principle completely free as to how to deliver the result,
- three kinds of result-oriented PSS can be distinguished: activity management/outsourcing; pay per service unit; functional result.

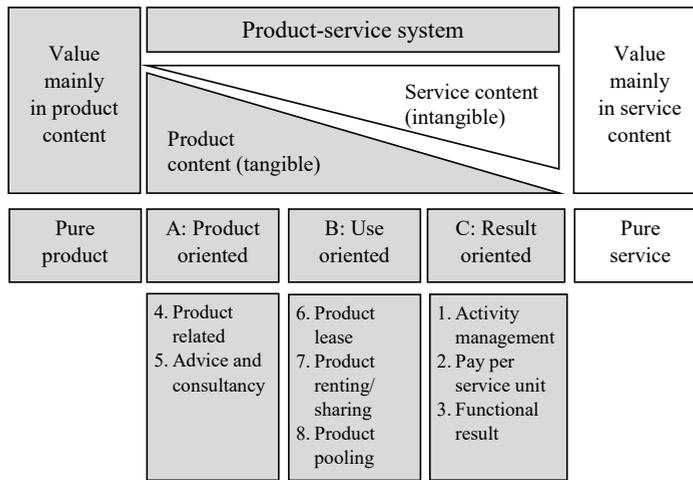


Figure 1. Classification of PSS

Source: Tukker, Tischner, 2005.

PSS in the industrial application have some important implications. In the case of the industry, the product side of the industry is mature, whereas service side is currently increasing. As described by F. Mahut, J. Daaboul, M. Bricogne, B. Eynard (2017), the saturation of historical product sales markets can be considered as a limit to overcome, meanwhile new technologies available enable reaching competitive advantages.

Internet of Things (IoT) enabled product service system (PSS)

Growing relevance of the IoT arises from the possibility of tagging, tracking, connecting and analyzing data from various connected objects. In 2020, the number of “things” (IoT/M2M devices) connected to the Internet will be according to various projections 25 billion or 100 billion. IoT implementations are being considered by a wide variety of manufacturing and service sectors. The reason for this arises from the opportunity of IoT to transform an old business model based on product delivery to a new business model which will allow to offer new ICT based services used with the product or instead of the product.

The challenge to address diversity of research on IoT was taken by IEEE IoT initiative. IEEE has published a document “Towards a definition of the Internet of Things” (IoT) where the authors have provided an overview of IoT definitions and the IoT basic architectural models. Authors (Minerva, Biru, Rotondi, 2015) pointed out that it is not easy to find a comprehensive definition of IoT. A definition often depends on a particular vision of the entity that wants to emphasize specific application field of IoT. One of the most relevant definitions of the IoT is:

“Bringing together people, process, data and things to make networked connections more relevant and valuable than before, turning information into actions that create new capabilities, richer experience and unprecedented economic opportunity for business, individuals and countries” (Bradley, 2013).

The description presented above was chosen due to the fact that it represents a point of view of an enterprise and emphasize the benefits of IoT from a business process and economic perspective, which reflect the profit motives as a main driver of IoT adoption.

A series of articles have shown that a design of a product service system is expected to be affected by the fast growing applications of Internet of Things technologies. ICT plays a fundamental role in supporting PSS business model. In this case, new ICT devices and system need to be in place. For example, IoT sensors, AI, pervasive computing can create a new business opportunities for PSS solutions.

Many researchers have explicitly stated that IoT technologies may bring new solutions for existing/hidden problems and inspire new designs. IoT is able to play a crucial role in the implementation of new services by manufacturing companies based on the PSS (Li-Hsing, Yen-Ting, Fenghueih, 2016). Porter and Heppelman (Porter, Heppelmann, 2014) stated that the adoption of digital technologies including sensors may trigger provision of additional services to an integrated product service offer. They pointed out that smart, connected products raise a new set of strategic choices related to the value being created and captured, the utilization and management of prodigious amount of new (and sensitive) data being generated, redefining relationships with traditional business partners such as channels, and the role the companies should play as industry boundaries are expanded.

IoT business opportunities

PSS are supporting the transition from the sale of the product to the sale of use/utilization of the product. Reshaping business model is possible due to implementation of interconnected and embedded technologies which make remote monitoring, controlling and long standing production possible and profitable.

Ole Kjeldsen from Microsoft (Kjeldsen, 2017), pointed out that “the Internet of Things isn’t a technology revolution (...) IoT is a business revolution, enabled by technology”. Microsoft believes that there will be:

- a) more than 21 billion connected “things” by 2020;
- b) market for IoT by 2020 – USD 1,3 trillion;
- c) 70% of value enabled by IoT which will come from B2B scenarios;
- d) USD 1,5 million as an average increase in operating income for digitally transformed enterprises;
- e) 10% of data on earth coming from IoT by 2020;
- f) USD 10 billion market for business process automation tools by 2020.

The main driver for IoT implementation in B2B context is to improve existing business operations and to create new product/offers and business model, such as moving from reactive to predictive maintenance and service – with the Internet of Things; possibility of asset, capacity, production sharing or data insight monetization and outcome based business model.

Business case for PSSs: Rolls-Royce

Rolls-Royce Limited was established in 1906 as a British luxury car and aero engine manufacturing business. Since then, the company has undergone many changes in their business design, from selling cars, jet engines and services for the civil, defence aerospace, marine and energy market to selling flying hours instead of jet engines. Their business customers have to pay a fixed charge per hour of engine operation.

The first step from selling pure product towards selling product oriented and use oriented PSS was the introduction of the ‘Power-by-the-Hour’ services for turbojet engines in 1962 (Rolls-Royce, 2012). Rolls-Royce then extended their offer for the airlines that use its turbojet engines by a complete engine and accessory replacement service offered on a fixed-cost-per-flying-hour basis. The implication of this offer was that airlines only paid for engines that performed well.

In 1990s, Rolls-Royce needed to change its business and service strategy due to a fact that their business model did not generate sufficient cash flows to justify massive R&D investments. As a result a ‘TotalCare’ offer was introduced in the mid-1990s in the civil aviation sector. Until the introduction of a ‘TotalCare’, the maintenance, repair and overhaul of its engine were not a dominant activity. In 1991 services represented only 25% of the company’s total revenue. Under a ‘TotalCare’ contract, Rolls-Royce undertook to provide the operator with a fixed engine maintenance cost over an extended period of time. In general TotalCare program consists of a menu of engine fixing and add-on services. The core elements are service integration, engine health monitoring and comprehensive engine overhaul, plus engine reliability improvements and Rolls-Royce initiated specialist maintenance. Add-on services include technical records management, engine transportation, spare engine support, additional overhaul coverage and the option for the customer to initiate specialist line maintenance (Ryals, 2010).

The core of the movement to more service-oriented business model was to better align the support network by capture and use of data in order to make the whole process more intelligent and efficient. Therefore, main transformation of the core of the company’s business model was possible due to the adoption of new ICT technologies. Due to the creation of some additional data handling capabilities, Rolls-Royce could enhance its engine health monitoring with the intention

of eradicating unscheduled repair or maintenance events. The evolution of Rolls-Royce services is presented in Figure 2.

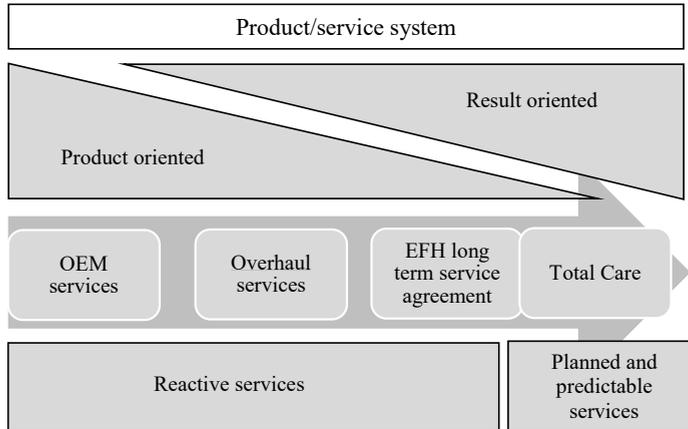


Figure 2. Evolution of Rolls-Royce services

Source: own elaboration based on Morris, 2014.

Every year, 60 million kB of engine health data is generated within TotalCare program which covered 23 million flying hours flown by 12,500 engines in 2010 (Ryals, 2010).

Even though this model was very successful, the company has recognized an important opportunity to expand its services by using IoT, machine learning and analytics. Since July 2016, Rolls-Royce has been using Microsoft Azure IoT Suite (cloud computing platform) and Cortana Intelligence Suite (data analytics package) to enhance their business offering. Company claims that the IoT will become an important part of the Rolls-Royce TotalCare programme which is based on earning revenue when aircrafts fly, rather than when engines are serviced. Microsoft will provide Azure IoT Hub service to connect to devices in the real world and gather data along with storage and analytics services. Cortana Analytics is a suite of fully managed Business Intelligence (BI), Big Data, and Advanced Analytics service offerings from Microsoft in the Azure Cloud. Cortana Intelligence will allow to process data from a variety of data sources, transform data, apply advanced analytical techniques (Data Mining, Machine Learning, etc.), and extract actionable insights which enable business to take intelligent and timely actions (Microsoft, 2017). The key pillars of Cortana Intelligence Suite offerings are: Information Management; Big Data Stores; Machine Learning and Analytics; Dashboards and Visualizations and advanced intelligence services. Cortana Intelligence Suite fits very well in Rolls-Royce business activities. Rolls-Royce has more than 13,000

engines for commercial aircrafts in service around the world (Rolls-Royce, 2017). By using a new ICT platform, Rolls Royce will be able to constantly monitor the engines and collect the data over time, which as a consequence will allow while accurately detecting operational anomalies and scheduling the maintenance accordingly to prevent potential downturns.

New ICT technologies have enabled Rolls-Royce to offer new services. Having the machine-generated data, Rolls-Royce is well positioned to provide predictive maintenance (replacing underperforming components), and value the service competitively. With the IoT, information on engine health, air traffic control, route restrictions and fuel use can be collected from hundreds of sensors inside the engines, and analysed to detect any operational anomalies or signs of developing faults.

The ongoing change in customer value propositions, such as “charging for engine use per hour” is an example of outcome-based value propositions in the form of Anything-as-a-Service (AaaS). AaaS proposals are very attractive for customers because risks are pushed upstream towards the suppliers of equipment and the need for non-core investments is minimized (Koychev, 2015). IoT enables a shift in this industry where outcomes can now be measured via sensors embedded in engine. In this case, we can see a general move towards higher utilization of equipment, and the use of predictive maintenance.

Rolls-Royce annual reports contain a detailed description of business, including the operations, performance and financial condition of the company. Annual reports can give the reader a lot of important information about a company transformation towards more service oriented PSS. In 2001, 40% of Rolls-Royce revenue came from service and aftermarket activities (Rolls-Royce, Annual report, 2001). From 1991 to 2006 we can notice increasing contribution from services revenue. Since 2006, Rolls-Royce services revenues account for over 50% of total revenue (Rolls-Royce, 2007).

Table 1

Service revenue as a per cent of total revenue

Rolls-Royce	1991	2001	2006	2012	2016
Service revenue (%)	25	40	53	52	52

Source: Rolls-Royce Annual reports, 1992, 2006–2007, 2012, 2016.

Rolls-Royce has also developed a new category of engine service and support aimed at the specific needs of aircraft lessors called LessorCare. In 2014, under TotalCare programme, leased aircraft accounted for over 1.7 m flying hours and over 800 m miles flown, which means that lessors constitute 16% of Rolls-Royce customers. In February 2016, lessors accounted for a third of its customers

and Rolls-Royce expects them to increase the importance to 50% in the future (Aftermarket revolution, 2016). Therefore, Rolls-Royce unveiled Lessor-Focused Aftermarket Services in January 2017 (Rolls-Royce, LessorCare, 2017).

Conclusion

PSS creates long term relationship among manufacturing companies and their clients. PSS is not a standardized business model, but a new way to provide tailored solutions for specific needs and problems. In the future we can expect that more product manufacturers will move towards more service oriented business models. This change of the strategies is a result of introduction of new ICT technologies i.e.: IoT and AI, which make this transformation possible and we therefore can observe a move from services on schedule towards services on demand.

This paper has highlighted new ICT developments as significant factors for reshaping business strategies. Rolls-Royce case can clearly demonstrate the move of manufacturing company towards the company offering goods and associated services rather than goods alone. IoT sensors, AI, pervasive computing have allowed to create long term relationship between Rolls-Royce and their business customers. The relationship will not be one time model as in the case of selling any kind of tangible product where the ownership is transferred. The transition towards long term service agreements has caused a paradigm shift in the business model for this company.

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**Od usług reaktywnych po usługi predykcyjne:
innowacyjny i zrównoważony model biznesowy
systemów produktowo-usługowych wspieranych przez IoT**

Słowa kluczowe: systemy produktowo-usługowe, ICT (technologie koordynacyjno-informacyjne), Internet rzeczy, model biznesowy

Streszczenie. Celem artykułu jest zbadanie pojawienia się nowego trendu w kierunku modelu biznesowego Systemów Produktowo-Uługowych (PSS – Product Service Systems) wspieranych przez ICT, wśród firm produkcyjnych, ze szczególnym naciskiem na Internet Rzeczy i analitykę. Chociaż PSS są już szeroko badane, wpływ nowych technologii ICT na propozycję wartości, jaką firma oferuje swoim klientom, jest mniej rozpoznany. System produktowo-usługowy wspierany przez Internet rzeczy (IoT – Internet of Things) umożliwia przekształcenie starego modelu biznesowego opartego na dostarczaniu produktu na nowy model biznesowy, który umożliwia oferowanie nowych usług bazując na technologiach informacyjno-komunikacyjnych, które można wykorzystać przy produkcji lub nawet zamiast produktu. Wiodące firmy produkcyjne już teraz osiągają większe zyski z obsługi posprzedażnej. Czujniki IoT, sztuczna inteligencja (AI), wszechobecne komputery mogą stworzyć nowe możliwości biznesowe dla rozwiązań PSS przez dostarczanie danych o użytkowaniu produktu i jego kondycji producentom, którzy mogą następnie wykorzystać dane do konserwacji zapobiegawczej i proaktywnej. Studium przypadku producenta silników Rolls-Royce’a użyto do analizy wpływu Internetu rzeczy, uczenia maszynowego i analityki na ofertę usług firmy oraz strategię biznesowe.

Citation

Windekilde, I. (2017). From Reactive to Predictive Services: the Internet of Things (IoT) Enabled Product Service Systems (PSS) of Innovative and Sustainable Business Model. *Marketing i Zarządzanie*, 4 (50), 117–127. DOI: 10.18276/pzfm.2017.50-07.

