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Decision Support Systems in Strategic Management

Contents

Investment Appeal Assessment of International Corporations

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Abstract
The objective of this article is to investigate the application of Elliott Wave Theory to the modern international business environment and more specifically the growth potential assessment of international companies. The special framework is developed to assess the investment attractiveness and growth potential of international stocks. The global companies from the hospitality industry were selected for the proposed framework application in order to determine the stocks with the highest investment attractiveness appeal and growth potential. The obtained results are presented. The proposed framework could further be used for investment attractiveness and potential growth assessment of different assett classes.

Keywords
Investment appeal, growth potential, global companies, international hotel chains.

Introduction

The examples of economic forecasting can be found in the very early stages of history. For instance, ancient Egyptians tried to make their harvest predictions already 3000 years BC ago. The general concept of strategic planning can be later seen in the first Chinese military strategy during the spring-autumn period of China (722-481 BC). This shows that forecasting has been used within the history in many ways and not just in the field of economics, as how it is mostly used now (Aimar, Bismans, & Diebolt, 2016). In the seventeenth century, Sir William Petty, a Londoner, identified a seven-year economic cycle, suggesting other bases for economic forecasting.

The history of the forecasting industry however really starts after the 1900's. The first forecasting industry was developed in the USA between 1910 and 1930. Many of these efforts were concerned with developing ''leading barometers''. Standard errors and multiple correlation coefficients were later used as indicators of forecasting validity. This industry was almost destroyed by the Great Depression of 1929-1939. These efforts can be considered as the foundation for systematic forecasts; afterwards foresight activities were also performed, but the latter were already part of the second phase of globalization. The term forecasting was used for the first time in 1930 by Wells, who also have used the term ''professors of Foresight'' for the first time. Hence, the terms forecasting and foresight were introduced and used in the same meaning until about the 1980s (Freeman & Louçã, 2002).

However, when one looks further into the foresight methodology it is important to note that relevant methods could be used more than once. Repeated foresight efforts could be seen in China, the USA and Japan around the 1950s and these were followed by similar efforts in France, The Netherlands, Germany and the UK in the late 1980s. Initially, South Korea, France and partly the UK oriented foresight projects in a more self-organized manner. They applied foresight data from the strategic planning of companies, and afterwards set priorities for different research programs. Such limited attitudes were less risky financially, but more appropriate for smaller countries. The fast diffusion of foresight to smaller and developing countries can be seen in the late 1990s. Within this time period foresight

was distinguished into strategic planning and forecasting itself. Foresight activities became the responsibility of experts in futurology and technology. Participation was limited to small teams of experts and futurologists. The new methods, e.g., Delphi, Scenarios, Brainstorming and Expert Panels were established (Kostin, 2018b, 2018a).

As it has been already mentioned, in the 1970s, there was a general rise in the importance of forecasting and strategic business planning due to the 1970 oil shocks. After the first initiatives in China and the USA, Japan had been performing wide-ranging foresight. In Japan the foresight methods were evolving over a long period of time which have reached new levels in the current economic environment. Most foresight activities after this period have often been developed or put into practice in the Netherlands and France. A higher diversity of foresights that were used to express a wider frame of future pictures in terms of considering different alternatives and creating actions to achieve a desirable future could be seen at the beginning of this century. Afterwards, stakeholder participation and networking were regarded as the new dimension of foresight activity for wiring up the multilayered innovation systems in the public and private sectors. The key issues in the first foresight generation were accuracy of prediction and the spread of results to non-experts.

In today's world, there are a multitude of decisions, actions, and transactions that are occurring simultaneously and globally (Grubor, Đokić, & Milićević, 2018). The ability to be one, two, or multiple steps ahead is quite possible now that enterprises have sufficient advancements in technology to be able to forecast and increase the probability for success. Yet, some enterprises still manage to fail, to declare bankruptcy, to dissolve. In order to stay afloat and still make considerable profits, countries and enterprises must be aware of the concept of global business and economic cycles and where they stand within them. Forecasting can be effectively used to predict the future and hence help global as well as local economies as well as companies perform better and earn the returns higher than the opportunity cost of capital. Understanding the nature of economic cycles is crucial for that (Glasner, 1997; Nordhaus, 1975). When one looks at the industrialized capitalistic economy one can easily see cyclical movements within economic activities. The economic cycle thus represents a

wave-like movement having a regularity and recognized patterns. That is to say, it is repetitive in character (Silvia, Iqbal, Swankoski, Watt, & Bullard, 2014). Thus, most of the sectors of the economy of businesses are directly affected by the economic cycle and its wave-like movement. It is important to mention that quite often different sectors are negatively affected by the economic cycle. These sectors often move within the same wavelength. During prosperity, most of the sectors or industries experience an increase in output and during recession they experience a fall in output (Umstead, 1977). The purpose of this article is to propose an investment attractiveness forecasting framework based on the Elliott Wave Cycle Theory and apply it in ordert o determine the stocks with the highest investment attractiveness appeal and growth potential.

1. The Elliott Wave Theory

The Elliott Wave is a theory established by Ralph Nelson Elliott (1871 – 1948), an American financial accountant, in the 1930s. It is a form of technical analysis which can be used to analyze financial market cycles and forecast market trends (Atsalakis, Dimitrakakis, & Zopounidis, 2011; Chen, Cheng, & Jong Teoh, 2007; Frost & Prechter, 2005). Elliott postulated that stock markets do not behave randomly, instead claiming that they move in repeating cycles which reflect the emotions and actions of humans that are the results of mass psychology (Chen et al., 2007). These patterns that Elliott coined "waves" are *"[...] repetitive in form but not necessarily in time or amplitude"* (Kotick, 1996). These waves connect with each other to establish bigger versions of the pattern with this cycle repeating itself.

Ralph Nelson Elliott developed the Elliott Wave Theory by discovering that stock markets which are thought to behave in a somewhat chaotic manner, in fact are traded in repetitive cycles. Elliott discovered that these market cycles resulted from investors' reactions to outside influences, or predominant psychology of the masses at the time. He found that the upward and downward swings of the mass psychology always showed up in the same repetitive patterns which were then divided further into patterns; he termed "waves" (Investopedia, 2018; Rumyantseva, 2004).

Elliott's theory is based on the Dow theory in that stock prices move in waves. Because of the "fractal" nature of markets, however, Elliott was

able to break down and analyze them in much greater details. Fractals are mathematical structures, which on an ever-smaller scale, infinitely repeat themselves. Elliott discovered that stock-trading patterns were structured in the same way.

2. Market predictions based on wave patterns

Elliott made detailed stock market predictions based on unique characteristics he discovered in the wave patterns. An impulsive wave which goes with the main trend always shows five waves in its pattern. On a smaller scale, within each of the impulsive waves, five waves can again be found. In this smaller pattern, the same pattern repeats itself ad infinitum. These ever-smaller patterns are labeled as different wave degrees in the Elliott Wave Principle. Only much later were fractals recognized by scientists. We know that in international financial markets "every action creates an equal and opposite reaction" as a price movement up or down must be followed by a contrary movement. Price action is divided into trends and corrections or sideways movements. Trends show the main direction of prices while corrections move against the trend. Elliott labeled these; "impulsive" and "corrective" waves.

The Elliott Wave Theory is interpreted as follows:

- Every action is followed by a reaction.
- Five waves move in the direction of the main trend followed by three corrective waves (a 5-3 move).
- A 5-3 move completes a cycle.
- This 5-3 move then becomes two subdivisions of the next higher 5-3 wave.
- The underlying 5-3 pattern remains constant, though the time span of each may vary (Investopedia, 2018).

To conclude this section, it is important to mention that Elliott Wave Theory has its devotees and its detractors like many of the other technical analysis theories out there. After analyzing the patterns of the Elliott Wave, it is clear through technical analysis that there is a fairly predictable pattern in this theory. The difficult part is in deciphering which part of the Elliott Wave one is experiencing. The best rule of thumb is to follow the previously-detailed principles. If one deduces the current phase of the Elliot Wave correctly, then one can invest during the rise of waves 1, 3, and 5 and divest when it is clear that the individual stock or index price fails to breach the resistance level set by wave 5 and begins to fall

below the support level set by wave A. One of the key weaknesses is that the practitioners can always blame their reading of the charts rather than weaknesses in the theory or vice versa. Failing in that, there is the open-ended interpretation of how long a cycle takes to complete. That said, the traders who commit to Elliott Wave Theory passionately defend it, so there could be more to the waves upon waves once you immerse yourself in the topic (Investopedia, 2018). We shall apply the Elliott Wave Theory principles in order to design and apply the framework for investment attractiveness assessment of international companies based on their stock price dynamics.

3. Research Methodology and Investigation framework

The Elliott Wave Theory was selected to determine the international company's stocks from the hospitality industry with the highest investment appeal from the following array of International Hotel Chains (IHC): Accor Hotels; Choice Hotels; Hyatt; Starwood, Wyndham Worldwide.

Based on the conducted analysis, the Elliott Wave Cycle Theory application was chosen for the stated problem. Based on the extensive analysis of the Elliott Wave Theory, it was concluded that it provides more gain for the risk given the stated problem we are to solve. Furthermore, based on our investigation, the argument that market cycles could be traced back to outside influences put forth in the Elliott Wave Theory along with the predominant psychology of market participants would allow us to get the most accurate results for assessing the market attractiveness and growth potential of the hospitality market investment classes over the 5-year period. According to our analysis, the shifts in mass psychology which result in repetitive patterns are best mathematically categorized into the impulsive and corrective waves by the Elliott Wave Theory. Hence, the Elliott Wave Theory allows making detailed stock market predictions based on unique characteristics in the wave patterns. After analyzing the patterns using this wave theory, given that the investigation timeframe is long enough (5 years), it is possible to forecast the potential stock price growth with a high degree of certainty.

Table 1 presents the assessment framework for the stock price trends within the framework of the wave theory (Kostin, 2018b).

Table 1 The assessment framework

Current wave of the cycle	Rating
1 wave	5/5
2 wave	4/5
3 wave	3/5
4 wave	2/5
5 wave	1/5
corrective wave A	1/5
impulsive wave B	1/5
corrective wave C	1/5

Source: Created by author based on the analysis of the Elliott Wave Theory

The mechanism of assessment interpretation presented in table 1 could be formulated as follows. An impulsive wave, which goes with the main trend, always shows five waves in its pattern. On a smaller scale, within each of the impulsive waves, five waves can again be found. In this smaller pattern, the same pattern repeats itself ad infinitum. Price action is divided into trends and corrections or sideways movements. Trends show the main direction of prices while corrections move against the trend: "impulsive" and "corrective" waves. Waves 1, 3, and 5 are the "impulsive waves", and waves 2 and 4 – the "corrective waves". The stock price increases with each "impulsive wave" and decrease with each "corrective wave", however in such a pattern that for each new wave the peak is higher than the previous peak (please refer to Figure 1).
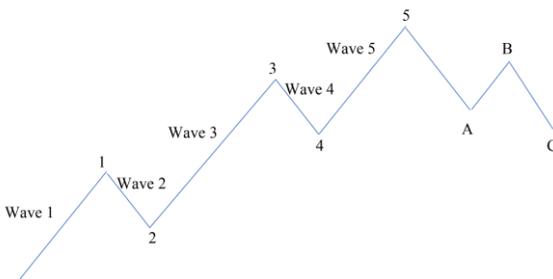
Figure 1 The cycle model within the framework of the Elliott Wave Theory
Source: Created by author based on the analysis of the Elliott Wave Theory

The maximum at the end of the 5th wave is considered the peak price indicator for the cycle. At the end of the 5th wave, the corrective phase begins. The correction disintegrates into three subsequent waves: two corrective waves (A and C) and one impulse wave (B). After that, the new cycle begins. Hence, we observe four impulsive waves and four corrective waves in one cycle.

The overall investment attractiveness evaluation is performed in accordance with the framework presented in table 2.

Table 2 Comprehensive criteria for investment attractiveness evaluation

Indicator	Valuation		
	-1	**0**	**+1**
	Reference values		
Cycle analysis (Elliott wave theory application)			
Elliot wave assessment framework, table 1	end of wave 5, corrective wave A, C, impulsive wave B in the corrective sequence (rating 1/5)	wave 4 (rating 2/5)	waves 1-3, detected end of wave C (rating from 3/5 to 5/5)

Source: Created by author

In the next section, relevant investigation will be conducted, and in the subsequent section the overall outcomes will be presented. The most promising investments will be selected and the choice would be justified.

4. Results

The results of our investigation of the International Hotel Chains stock performace will be presented in this section. The stock performance of the following companies within this investment class over a 5-year period will be investigated based on the proposed framework for the investment attractiveness evaluation: Accor Hotels; Choice Hotels; Hyatt; Starwood, Wyndham Worldwide. As was already mentioned earlier, the proposed cycle model within the framework of the Elliott Wave Theory will be applied.

Let us begin with the evaluation of the stock performance for this investment class from Accor Hotels over the 5-year period from January 2010 to January 2015. The relevant stock price performance is presented in Figure 2.

Figure 2   Evaluation of the stock price performance of the Accor Hotels over the period from January 2010 to January 2015.
Source: NYSE.

Based on the analysis of stock price performance for Accor we could conclude that the stock price entered the 5th impulsive Elliott wave. In the short run the corrective wave A is to follow, hence the stock price will go down. Therefore, we assign the 1/5 rating for Accor in accordance with our assessment model.

The stock price dynamics for Choice Hotels, presented in Figure 3 demonstrates presence in the 3rd Elliott wave phase.
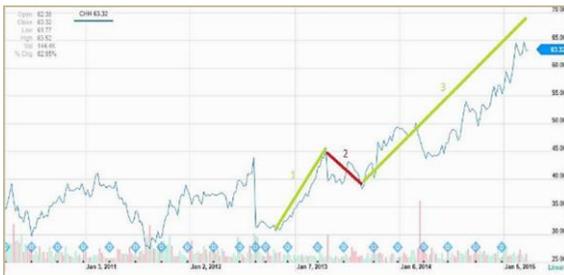
Figure 3   Evaluation of the stock price performance of the Choice Hotels over the period from January 2010 to January 2015.
Source: NYSE.

According to the analysis the cycle had started in 2012. It is important to note that the wave length is rather long (50%, from 45.03 dollars per share to 65.11 dollars per share) and the correction (wave 2) is rather short. Hence, despite insignificant correction with the 4th wave we could expect the stock price to peak. Therefore, we assign the 3/5 rating for Choice Hotels in accordance with our assessment model.

The Hyatt Hotels stock price performance presented in Figure 4 is indicative of the 4th Elliott wave phase.
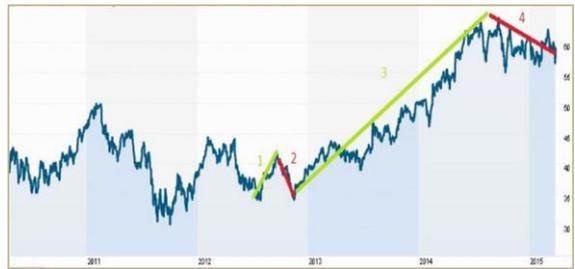
Figure 4   Evaluation of the stock price performance of the Hyatt Hotels over the period from January 2010 to January 2015.
Source: NYSE.

The cycle for the company had started in October of 2012. The next, fifth wave will reach the potential peak according to our model, hence the stock price will rise. Hence, we rate Hyatt at 2/5 in accordance with our assessment model.

The cycle for Starwood, as presented in Figure 5 had started in July of 2012.

Figure 5   Evaluation of the stock price performance of the Starwood over the period from January 2010 to January 2015.
Source: NYSE.

In January 2015 the presence of the 5th Elliott wave could be observed. During this phase the stock price must peak, afterwards, however the corrective wave A is expected. Hence, the stock price will fall. Therefore, we assign the 1/5 rating for Starwood in accordance with our assessment model.

According to Figure 6, the first Elliott wave for Wyndham stock price picks up in October 2012.

Figure 6   Evaluation of the stock price performance of the Wyndham Worldwide over the period from January 2010 to January 2015.
Source: NYSE

In January 2015 the company's stock price enters the 3rd Elliott wave phase, which is the longest phase of the cycle. Hence, the stock price potentially faces being at the beginning of the corrective 4th wave, which nevertheless is rather short and will be followed by the 5th wave which is expected to reach the cycle peak. Hence, we assign the 3/5 rating for Wyndham Worldwide.

The overall evaluation results for the International Hotel Chains based on the proposed cycle model within the framework of the Elliott Wave Theory are presented in table 3.

Table 3 Evaluation results for the International Hotel Chains based on the proposed cycle model within the framework of the Elliott Wave Theory

	Accor Hotels	Choice Hotels	Hyatt	Star-wood	Wynd-ham World-wide
Elliott wave phase detection	**0,20 (=1/5)**	**0,60 (=3/5)**	**0,40 (=2/5)**	**0,20 (=1/5)**	**0,60 (=3/5)**
Valuation	**-1**	**1**	**0**	**-1**	**1**

Source: The author

Based on the analysis performed it could be concluded that the most attractive International Hotel Chains to invest in are the Choice Hotels and Wyndham Worldwide. Their stock price is expected to rise within the framework of the proposed model of cyclical development.

Conclusions

Based on the conducted analysis, the Elliott Wave Theory application was chosen for the stated problem of determining the stocks with the highest investment appeal from the International Hotel Chain assett class. The Elliott Wave Theory allows making detailed stock market predictions based on unique characteristics in the wave patterns. After analyzing the patterns using this

wave theory, given that the investigation timeframe is long enough (5 years), it is possible to forecast the potential stock price growth with a high degree of certainty. Hence, after the evaluation via the suggested assessment framework, the investment attractiveness for selected group of international companies was obtained. The evaluation in accordance with the criteria, described in the article have shown that among the International Hotel Chains – Choice Hotels and Wyndham Worldwide have the highest investment appeal. The suggested framework could further be used for investment attractiveness and potential growth assessment of different assett classes. **SM**

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Strategic Analysis of Corporate Marketing in Culture Management

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Abstract
Postmodernism dictates the boundaries of culture that once perceived and imposes new insights. Adding a symbolic meaning to brands expands the understanding of cultural brands. The purpose of this paper is to analyse and discuss the strategic positioning of corporate marketing in segment of cultural management. Insights and reflections derived from corporate marketing and from the brand theory literature are adopted in the paper. Author of the paper analysed three type of cultural segment: school, theatre and museum. The behaviour of employees is very important element in the expression of corporate identity. In this paper, we compare all three segments of culture with Balmer and Aaker's model. We describe a model for managing corporate brands, corporate identity, corporate image and corporate reputation. Author of the paper draws on key literature relating to corporate marketing and marketing in culture. Main goal is to broaden our understanding corporate branding using a model C^2ITE, AC^4ID Test and brand personality. Finally, we review corporate identity and image as key factor in building culture management. Ultimately, the culture brand is based on the essence of art, to the desired image that makes the vision of brand, that is, from a consumer perspective, a renaissance individual with a need for cultural brands.

Keywords
Corporate marketing, brand, identity, brand personality, culture management.

Introduction

For centuries, there are common interdisciplinary and intermediate ties between culture and art. Just remember the Fin de Siècle of European modernism (Jensen, 1994, p. 18) and relation toward the theatre. There are very few common notes about the term of culture and marketing (Meler, 2006, p. 174), especially marketing in museums and theatre. The reason for this comes from the very nature of art: art is not for practical use and is limited to a smaller number of people. Art presents a personal view of society, and the work of art becomes a reflection of such a viewpoint. Culture represents the totality of human accomplishments and artistic expression.

An outcome of art, theatre or museum product is of no use to audience if it does not get in communication with the viewer. The play is an artistic act according to the theory of theatre (Balme, 2011, p. 1). At the same time, the theatrical performance without regard to the viewer is not completed and complete theatrical act. From a production point of view, without a viewer, theatrical performance represents uselessly spent money. In addition, the modern museum represents a place of interpretation of social values and culture. It is evident that the culture of going to the museum and the theatre appears because of creating cultural needs.

Culture as well as any other activity requires an appropriate organization and management in order to achieve that management in culture is not controversial. As in any other production and theatrical production, it produces a product for selling. The same goes for the museum just because the message was transmitted to the employees and the interpretation of the exhibits. However, what is controversial is certainly a myth that culture and marketing cannot go together.

1. Culture as a product

Culture is one of the two or three most complicated words in the language (Williams, 2015, p. 87). Postmodernism dictates the boundaries of culture that once perceived and imposes new insights. Although postmodernism proved to be a problematic and indeterminate concept, particularly from the aspect of the new marketing paradigm (Brown, 1993, pp. 19-34), here we will observe it from a marketing and cultural perspective. Postmodernism in culture leads to the predominance of production over the reproduction, which is also a postmodern feature, because of such understanding everything is becoming cultural.

It is evident that postmodernism leads to the collapse of the communication itself in which everything becomes simulated (Baudrillard, 2017, pp. 121-129). Accepting the theory of simulacrum, society is based on production and image exchange, and consumers have nothing to do with the reality that these images mean. Postmodern marketing is the foundation of such consumer change. Production, reproduction, image, simulation, and brand are no longer a result of the circumstances (Firat & Venkatesh, 1993, pp. 227-249). Modern society's consumer behaviour is characterized by consumer desires that are created and need not to be based on real needs. The needs are created and transformed into images that become consumer real wishes.

Culture is viewed as a "battlefield" (Eagleton, 2002, pp. 51-87) because they contrast each other with various forms of cultural activity from identity to popular culture (Strinati, 2004, pp. 5-18). Despite the fact that culture is understood differently, the concept of culture, according to Said (1994, p. 12), implies a "sublime element", and in postmodern society it implies the overall way of life of people (Eagleton, 2002, p. 47). Cultural theorists (Said, 1994, pp. 12-37; Eagleton, 2002, pp. 54-73; Strinati, 2004, pp. 5-45; Colbert, 2012, pp. 13-37; Williams, 2015, pp. 87-93) cite the dynamics of culture on the one hand, while on the other hand they speak of symbolic experience. The concept of culture is a complex, multidisciplinary construct and cannot include in itself a unique, universal definition. If we accept the metaphor of culture as a battlefield (Eagleton, 2002, pp. 51-87) then culture can be seen as dominant and popular, accepting the fact that popular culture should not be considered less valuable than the opposition of high culture, so called sub culture (Williams, 2015, p. 92).

In this way, the difference between culture and popular culture is wiped out because in postmodernism everything can turn into a reference to popular culture, even the worship of the brand. Brand Cult (Acosta & Devasagayam, 2010, p. 168) represents a powerful brand-worship identifying with a group of like-minded people. Consumers perception of identity is very important as well as the perception of social belonging to a particular brand, which is particularly pronounced when analysing the relationship between employees and consumer (Homburg, Wieseke & Hoyer, 2009, pp. 38-54)

This is especially true in management of culture because the needs for artistic values of man are not innate and do not exist as a natural phenomenon. That is why every community in each culture develops and promotes such a need through the education system. The inborn need for the theatre, the connection between man and culture and theatre as the basis of civilization will be seen as a cultural product that depends on theories of corporate marketing (Balmer, 2001a, pp. 1-17).

We cannot see artwork as consumer goods because it is not designed to satisfy consumer desires. Ideas and emotions can be branded (Keller, 2001, pp. 15-19). After all, consumer perceptions and emotions are the key factor in creating an image. The myth of mistrust of culture and marketing, especially in non-profit organizations, represents a tremendous psychological resistance to marketing. This is because the state secured the survival and functioning of the institution. In market-oriented conditions, cultural production relies on social marketing (Lee & Kotler, 2016, pp. 21-25). Social marketing promotes ideas as opposed to classical marketing that sells the product. That is, exhibitions, performances or visits to museum services, and producers are resellers. Exactly because the need to consume cultural products and services is not natural, it is necessary to systematically encourage and shape it.

1.1. A prototype of culture

The term cultural institution occupies a significant place in society. They are a reflection of the cultural identity of every nation. Cultural institutions enable citizens to open themselves to a multicultural aspect and directly represent different cultures (Colbert, 2012, pp. 13-27). It follows from the above that cultural institutions are dichotomous: they depend on production, i.e.

those performing arts, such as theatrical performances and those that depend on reproduction, i.e. those that perform already existing works such as cinematography or publishing.

The specificity of the cultural product itself is in a paradox. An artist should offer his work, which is a moment of inspiration, while at the same time the consumer needs to adapt to his product. The problem is bigger because the institutions depend on this product (service) on the one hand and on the other hand depend on consumers. On the artistic side, each piece is a prototype because once performed it cannot repeat the same way as a theatre play or opera cannot have the same quality if another orchestra performs. This means that distinguishing products from products in art creates a prototype of a cultural product that is also serially reproduced (Colbert, 2012, pp. 31-37).

The orientation of the organization's mission can be positioned on a continuum from market focus to product focus (Cox, Radbourne & Tidwell, 1998, pp. 180-187). The production of artwork consists of unique products that are not intended to be reproduced, such as artistic paintings or sculptures in museums. However, reproduction of prototypes, such as books or films, creates prototypes of culture as a product. So every piece of art is a prototype (Colbert, 2012, pp. 13-27), but at the same time the purpose of the prototype is to reproduce in multiple copies, which is specific to replicas in museums or theatrical performances. Figure 1 shows the criterion for distinguishing cultural works from the aspect of cultural organization.
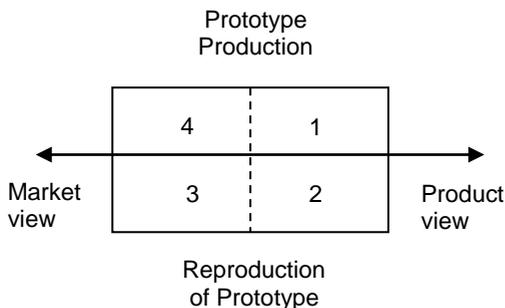
Figure 1 Criteria for cultural prototype
Source: Adopted by Colbert, 2012, pp. 7-19

In square 1, organizations are grouped, focusing on creating unique art (cultural) products - prototypes. Classical examples are theatres that perform performances or museums that preserve

the original cultural goods. Square 2 is a group of corporations that produce the product in multiple copies, and they are the opposite of square 1 because they start from reproduction of a predetermined prototype. These are mostly publishers or directors who also belong to the art sector. Square 3 shows organizations that are focused on the market and there are most cultural industries and distributors there. In square 4, cultural brands are grouped. Such organizations produce unique cultural works that are focused on the market but respect the production of prototypes.

Relying on postmodern postscript (Brown, 2001, p. 118), art and marketing are much closer than implied. At the same time, accepting the theory of simulacrum (Baudrillard, 2017, p. 121-129), the society is based on the production and exchange of images, that is, postmodernism emphasizes the influence of symbols on the design of needs. That is to say, in the postmodern marketing paradigm, the consumer becomes an active participant in the repositioning of images and symbolic meanings. In the field of art, where emotions play an important role, the hedonic satisfaction of the consumer experiences from contact with the artwork is a key element (Colbert, 2014, p.564).

1.2. Cultural brand

The brand represents a promise that eventually evolves into corporate reputation. By doing so, reputation becomes undoubtedly the most significant asset in modern management. An important strategic decision for each corporation is how to mark the brand (Kotler & Keller, 2008, p. 296): as a single name, general, or a corporate name. Corporate reputation is the result of continuous action over time and this is the key difference between the brand name and the corporate brand. The corporate brand encompasses a wider spectrum and requires coordination of a number of elements that directly or indirectly affect the ultimate outcome. In addition, a greater number of elements have a reflection on the creation of brand personality (Aaker, 1997, pp. 347-357).

The brand identity is a unique set of associations found in consumer and other stakeholder impressions (Aaker, 1996, p. 27) and is one of the key brand building factors. The cognitive perspective of consumers towards brands starts with the strength and brand association. Brand strength is based on good

positioning of the brand, i.e. its most important component, consumer associations.

The brand's personality construct is understood as a form of attributing the character of the brand's human character in order to achieve distinctiveness. Such a brand dehumanization construct approaches consumer perceptions, associations and impressions according to brands. The brand's personality is based on the hypothesis that the consumer is perceived by the personification of human traits as shown in Figure 2. The brand's personality is perceived as a multidimensional construct expressed through consumer's emotional attributes and is most often represented through five dimensions: honesty, excitement, ability, refinement and ugliness. Each dimension consists of facets that represent the character of the dimension as illustrated in Figure 2.
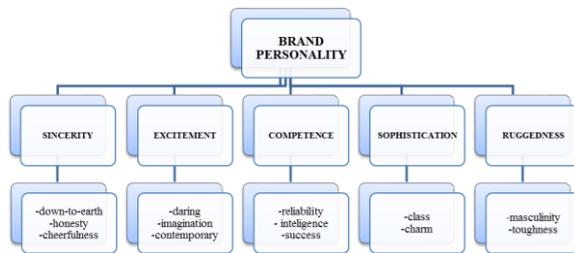
Figure 2   Brand Personality Dimensions
Source: Adopted by Aaker, 1997, pp. 347-356

The brand's personality was built according to the theory of anthropomorphization (Epleye, Waytz & Cacioppo, 2007, pp. 864-886), indicating that brands are changing according to visibility. Personality has proven to be useful for analysing consumer behaviour for brand choice as it reveals how consumers feel about brands. Brand personality (Aaker, 1997, p. 347) is defined as a set of human characteristics associated with a brand. Consumers make brand choices based on the perception they have of themselves.

We distinguish the concept of a cultural brand from the image aspect. Brand image results from the favourability, strength, uniqueness and types of brand associations held by the consumer. All brands are cultural (O'Reilly, 2005, p. 582), but there are different types of cultural brands that we called cultural brands and are divided into three categories: cultrepreneurs, commercial corporations and cultural corporates. The term cultrepreneurs represents well-known artists who have adapted their marketing strategy to promote themselves as cultural icons or art brands. The second group of cultural brands are commercial

corporates and they are, from a sociological aspect, a cult brand (Acosta & Devasagayam, 2010, p. 168), which over time become icons through mythic creation process or simulation of simulated simulacrums (Baudrillard, 2017, pp. 121-129). Finally, cultural corporations are organizations such as theatres, museums, schools, universities, art galleries and all organizations that incorporate culture in the wider sense of the word. Each type of cultural brand starts with a key segment of an image, i.e. an association, so cultrepreneurs start from creating an icon. Commercial corporate is the starting point of simulation, and cultural corporations are based on the association of culture as illustrated in Figure 3.
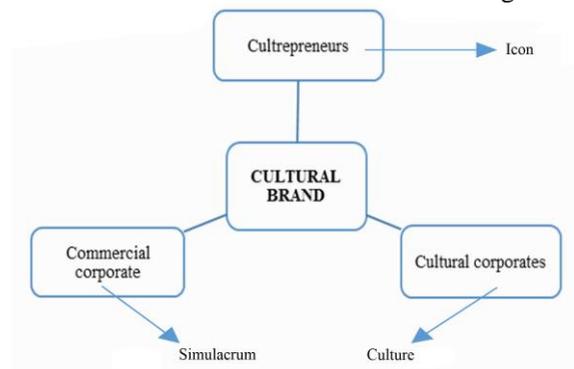
Figure 3   Cultural brand and associations
Source: The author

By adding symbolic meaning to brands, the understanding of cultural brands is widening. Brands are not only at the symbolic level of cultural products but also in sociological, especially if we analyse them from the aspect of the brand of gold or the brand attachment construct. The theory of attachment (Steele, 2003, pp. 83-101) starts with the assumption that beliefs and self-confidence feelings are predetermined by the object of self-reliance. Attendance is interpreted as an attachment to the object, as the consumer is viewed from the perspective of the consumer's relationship to marks (Park, MacInnis & Priester 2008, p. 4). The attached object becomes associated with consumer self-promotion, which implies a consumer's perception. To create brand behavioural loyalty is not enough, strong personal attachment is also necessary (Keller, 2001, p. 15). Actual self-congruence has the strong influence on emotional brand attachment (Malar, Krohmer, Hoyer & Nyffeggern 2011, pp. 35-52). This effect is even more pronounced when it comes to cultural brands because consumers are involved in the

prototype of culture especially when it comes to the interpretation of cultural goods in the museum or theatrical performances.

2. Corporate marketing analysis in culture

Corporate marketing starts with corporate identity and brand. The increased interest in corporate brand, both in science and marketing, has been occurring in the last twenty years (Balmer, 1995, pp. 24-46; Balmer & Sonsen, 1999, pp. 69-92; Balmer, 2001a, pp. 248-249; Balmer, 2001b, pp. 11-21; Hatch & Schultz, 2001, pp. 129-134; Harris & de Chernatony, 2001, pp. 441-456). The syntagma of corporate brand, which today is known as the marketing doctrine, is not identical to the notion that emerged in the nineties (King, 1991, pp. 43-52).

The corporate brand represents a special form of marking strategy where different segments of management and marketing play a very important role. The corporate brand building most often implies the organizational value of the corporation, the core and the benefit (Urde, 2003, pp. 1017-1040). At the same time, the assumption that the corporate brand will be built in the organization is conditioned by internal and external factors. The corporate brand is a rare entity of marking due to the unique development of the organization (Balmer, 2001a, pp. 248-291). It is an acknowledgment to the corporation that they themselves can contribute to brand development through differentiation, identity, legacy, communication and consumer relationships (Schultz & Antorini & Csaba, 2005, pp. 9-20). In order to build a corporate brand, organization must first build a corporate culture that will encompass employee behaviour.

However, since the organization culture is deeply rooted in the employee's perception, it is necessary to develop the brand identity on the cultural reputation, i.e. on the coherence between the brand promise and the performance that employees provide. Trichotomy of a corporate brand is analysed by Keller's methodology of image (Keller, 2001, pp. 15-19; Keller & Aperia & Georgson, 2008, pp. 42-87). The first associations of corporate brand images that correlate with Kapferer's brand identity (Kapferer, 2008, p. 183) relate to employee attributes, benefits, and corporation correlations. Such associations, according to the CBBE model, are called picture of images and they are socially responsible. Table 1 shows the relationships of identity, image, culture, personality and corporate brand.

Table 1 Correlations of corporate brand elements

Corporate Brand	Corporate Identity	Corporate Image	Corporate Culture	Corporate Brand Personality
The sum of identity, vision and corporate image	Brand features that represent corporation	Impressions that creates corporate identity	Employee and clients relationship	Brand values that are projected through corporate culture

Source: The author

The corporate brand concept includes management decisions and corporate culture to unite the three virtues of corporations that we understand in the holistic aspect of all levels of management, communication, and service delivery. The basic difference between a corporate brand and a brand of goods or services begins with managerial-marketing changes. The initiator of the change is no longer just a marketing manager but a complete management, becoming responsibility of all employees at the end. The corporate brand focus encompasses the entire organization, all internal and external factors, unlike the brand focus that entirely depends on consumer perception. The role of corporate identity, image and culture is of crucial importance for the development of corporate marketing (Balmer & Greyser, 2006, pp. 730-741).

The responsibility of non-profit organizations, such as schools, theatres and museums, is based on the amount of services and customer satisfaction. For this reason, the application of strategic marketing planning is necessary to achieve the efficiency of the exchange of services. The benefits of applying strategic marketing in cultural management are numerous: target groups are determined, user needs are defined, financial stability is ensured and quality communication between service providers is ensured as well.

Table 2 shows the characteristics of corporate brand C^2ITE model. The model illustrates the characteristics of corporate brand through five key concepts, starting with the culture that encompasses "cultural roots" (Balmer, 2001a: 248-291; Balmer & Gray, 2003, pp. 972-997), the value of corporate culture, subcultural milieus, regionalism and nationalism.

Table 2 Model C²ITE

Characteristics	Performance
Culture	"cultural roots", subculture, nationality
Intricate	Integrated communication, multidimensional
Tangible	visual brand identity, consumer relations
Ethereal	style, associations, emotional impressions
Commitment	reputation, employee support

Source: Balmer, 2001c, p.3

The concept of cultural roots metaphorically embraces elements of heritage, nationality, history, culture, and all forms of corporate culture that imply employee relationships. The remaining characteristics are complemented by the elements of the corporate brand. In order to segment the market of cultural brands, the producer plays the key role, with need to have a clear vision of his performance on the market. Table 3 shows the symptoms of the theatrical prototype that originate from the particularity of the performance itself to the possibility of adjustment. Next, Table 4 and Table 5 show the prototypes of museum adaptation to the market and the role of school in the cultural context.

Table 3 The dimensions of theater in cultural management

The specialty of the play	The advantages of the play	Time limitations	Category of the play	Customize of the play
Type (comedy, drama, tragedy, opera) Type (premiere, reprise, guest play)	Differentiation (first performance in the city, premiere, new text) Cultrepreneurs (famous actors)	Accompanied (anniversary of the death of a writer, Christmas concert, avant-garde)	Differentiation (school, university, young audience, subculture, middle class)	Advertising (the most prized show, theatre of the absurd, national)

Source: The author

Unlike products, services and art experiences cannot be tried, seen, or tested in the classical sense. Precisely because of the characteristics of intransigence, services have a particularly important role in art because it depends heavily on two factors: user perception and employee motivation. Let us analyse the first factor, the service user. Cultural institutions can offer their cultural brands, prototypes (Colbert, 2012, pp. 13-27) by having to "materialize" them through posters, brochures, books, and by that act to create a proto-brand. Proto-brands are the pioneers of today's modern brands (Moore & Reid, 2008, pp. 419-432) because they marked the goods with the same marks that represented a certain degree of quality and place of creation. Such prototypes included a certain value for consumers and the power of differentiation, and in the cultural segment, they are a semi-tangible service.

Table 4 The dimensions of museums in cultural management

Exposure specialty	The advantage of the exhibition	Time limitations	Exhibition category	Adaptation of the exhibition
Type (archaeological, artistic, technical, historical, ethnographic)	Differentiation (the first type of museum in the city, new exhibits) National, regional, city	Engagements (branding, anniversary of death, related to the project)	Differentiation (tourist, school, university, young audience, sub culture)	Appropriate (local, national or international exchange, galleries) Salons, clubs and schools

Source: The author

If, on the one hand, there is a complex art museum or classical theatre, and on the other hand, there is a need for theatres and museums that are not concerned only with classic themes, there is a question of consumer identity. Conflict between modern society, the break between classical culture and popular culture leads to postmodern marketing. Cultural turmoil takes place in three ways: between cultures as evidence of civilization, culture as postmodern and culture as identity. Such differences (Eagleton, 2002, p. 67) between culture and culture (Williams, 2015, p. 92) lead to postmodern marketing dominance. Identity in the postmodern society is a transformation of traditional identity. The accelerated growth of museums and theatres is the answer to the loss of such identity, which is particularly noticed in the evolution of marketing in art as a sub discipline (Colbert, 2017, p. 8).

Table 5 The dimensions of the school in cultural management

The specialty of the school	The advantage of school	Time limitations	Category of school	Adjusting the school
Educational factors (cognitive, psychophysical social and emotional)	Creating needs (learning, guest performance, galleries, literary debates)	Attractive (school culture, events, subscriptions, excursions, organized visits)	Types (gymnasium, art and vocational)	Presentations (school days, thematic workshops, marking period)

Source: The author

The museum's role was once the collection of encyclopaedic knowledge, affirmation of identity and consciousness of society, but also as a motive for prestige. The museums have raised the level of culture. The museums have experienced a new way of encoding culture, and together with theatres, they have taken forms of consumer identification. In such an environment, great emphasis is placed on employees who are carriers of cultural services. In essence, the most important management segment in culture is the role of employees (Colbert, 2003, p. 288). It is therefore time to forget the myth of the incompatibility of marketing and culture, as

cultural goods production is one of the leading industries (Colbert, 2014, p. 563).

The AC[4]ID Test has its origins in earlier models of identity-alignment (Balmer, 2001a, pp. 248-291; Balmer & Gray, 2003, pp. 972-997). AC[4]ID Test approach can be of assistance to corporate marketing managers in ensuring their corporate brands remain vital and meaningful to the shareholders and stakeholders. Seven identities types comprise the corporate constellation: Actual, Communicated, Conceived, Covenanted, Cultural, Ideal and Desired corporate identity. AC[4]ID Test is a strategic, diagnostic and normative to which brand identities should be calibrated (Balmer, 2012, p. 1067). Cultural management was analysed according to the AC[4]ID Test in Table 6.

Table 6 AC[4]ID Test of culture brand in cultural management

Identity type	Culture brand	Construct cultural management
Actual	Art	Corporate identity
Communicated	Reputation, prestige	Corporate brand communication
Conceived	Image	Corporate image
Covenanted	Education	Corporate brand
Cultural	Employee quality	Corporate culture
Ideal	Efficiency	Corporate brand strategy
Desired	Homo universalis	Corporate brand vision

Source: The author

The first identity is current and represents a realistic positioning type that includes internal values, employee behaviour and activities. The communicated identity encompasses corporate image, corporate reputation and overall corporate communication. Conceived includes the way the brand sees it. Covenanted embraces the brand in the widest sense, it represents the promise that the brand fulfils. Cultural identity is not the same as the cultural brand already represents the role of employees, their behaviour, beliefs and values. The desired identity includes the management vision and the corporate mission of the organization. Finally, the ideal identity points to the optimal, ideal positioning strategy. From the aspect of the culture brand, it starts from the very essence of art as an educational and entertainment component to the desired one that makes the renaissance individual.

Conclusion

The demands for artistic values are not innate and do not exist as a natural phenomenon and therefore need to be systematically stimulated. Artwork is not seen as consumer goods because it is not designed to satisfy consumer desires. However, postmodernism in culture leads to the dominance of production reproduction that enables the creation of a cultural brand. Accepting the theory of simulacrum, the society is based on the production and exchange of images (Baudrillard, 2017, pp. 121-129) which are based on the symbolism of the brand. From the aspect of cultural management work of art is a prototype (Colbert, 2012, pp. 13-27), and the purpose of the prototype is to reproduce in order to exist in multiple copies. What is common to all categories is precisely its metaphoricity and personification of the brand (Keller, 2001, pp. 15-19). The responsibility of non-profit organizations such as schools, theatres and museums is based on the scope of services and meeting the needs of users. The features of the corporate brand C2ITE (Balmer & Gray, 2003, pp. 972-997) reveal the symptoms of the theatre prototype, museum exhibits and the influence of the school as the creator of the need. The museums have experienced a new way of encoding culture and, together with the theatres; they take on the forms of consumer identification presented in the AC4ID Test model that reveals brand vision.

The cultural object (Griswold, 2013, p. 94) is perceived as a symbolic element of the cultural tradition and it is gradually changing over time. By doing so, going to theatre play, picture gallery or museum, makes the symbolic value of a cultural product. Buying such cultural brands is an extension of consumer self-reliance. Consumer culture is characterized by social organization in which the relationship between cultural resources merges with symbolic values in the market. Ultimately, the culture brand is based on the essence of art, to the desired image that makes the vision of brand, that is, from a consumer perspective, a renaissance individual with a need for cultural brands.

Future research should analyse the role of employees in cultural activities. The role of employee is of crucial importance for brand value. (Balmer & Gray, 2003, p. 979). Corporations with loyal employees, who have the same corporate brand affinity, indicate that the corporation has multiple benefits. The role of employees is one of the most important in the sphere of art because

employees are in the first contact with consumers. In addition, the correlation between the dimensions of cultural values proposed in this paper, but from the aspect of school management and marketing in art, should be researched. ■SM

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Promoting gender-responsive talent management in police organizations through strategic HRM measuring

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Abstract

Gender-responsive talent management assumes attracting, developing and retaining a required talented workforce in a way that promotes gender equality. Ensuring the balanced representation of female and male personnel is essential for police services to be able to prevent, detect and investigate crimes against women and men effectively. However, in a number of countries police organisations continue to be predominantly male with poor representation of women in high-ranking positions, and owing to the underutilization of their skills and discriminatory attitudes and policies, sexual harassment and difficulties combining police work with family responsibilities. Therefore, in this paper we seek to explore and propose a strategic HRM instrument for promoting a gender-responsive talent management in policing through measuring.

Keywords

Strategic human resource management measuring, talent management, gender equality, policing.

Introduction

The police appear to have an important role in society and provide a wide range of services to the community. They are usually accountable for the following: maintaining law and public order in society; preventing, investigating and combating crime; maintaining, protecting and respecting the individual's fundamental rights and freedoms; and protecting individuals and communities from harm (Bastick, 2014). The police include all law enforcement agencies, such as the police and gendarmerie-like constabulary forces that exercise police powers, especially the power of arrest and detention (OECD DAC, 2007, p. 163). Nowadays, when majority of societies highly value democracy, openness, respect for human rights and equality, and are facing more harmful and severe forms of crime, a high-quality and modern policing is fundamental to the creation and protection of a society that values freedom, fairness and responsibility. It is believed that a modern policing should be constitutional (protecting the civil rights guaranteed by the Constitution), just and respectful, deeply connected with the community it serves, using force judiciously, transparent and accountable, using "best known methods" of policing and committed to continuous improvement, following and applying research regarding effective policing practices. Furthermore, to be effective, the police need both to recognize and address the different needs of women and men in the communities they serve and to provide that policing, as a profession, is equally open to women and men and that women and men are treated fairly as police officers. As such, a modern policing requires professionalization of police service, gender equality and new set of skills and abilities to provide for better service to citizens. This draws attention to the significance of the gender-responsive talent management in policing which symbolizes a necessity to build democratic societies and professional and high-quality policing.

Gender-responsive talent management assumes attracting, developing and retaining a required talented workforce in a way that promotes gender equality. Ensuring the balanced representation of female and male personnel is essential for police services to be able to prevent, detect and investigate crimes against women and men effectively. However, according to Bastick (2014), although various surveys indicate that women can often bring different, useful skills and strengths to increase the effectiveness of police work yet in a number of countries police organisations continue to be predominantly male with poor representation of women and the recruitment processes discriminate against women who are often disproportionally overrepresented in low-ranking positions, and often end up leaving as a result of the underutilization of their skills and owing to discriminatory attitudes and policies, sexual harassment and difficulties combining police work with family responsibilities (Bastick, 2014; Martin & Jurik, 2006). Monitoring HR processes, paying particular attention to the different experiences of women and men, can help a police service to address these problems, and to increase the recruitment, retention and advancement of talented female staff.

In this paper we seek to explore and propose a strategic HR instrument for promoting a gender-responsive talent management in policing through measuring. For that purpose we made an attempt to develop adequate strategic measures and indicators and to create a gender-responsive talent management instrument for policing, which would provide for increasing women's participation and involvement within the institutions of security systems, primarily by improving HR policies, practices and metrics in these institutions.

1. Defining talents and talent management

Many authors agree that talents imply people as individuals who represent `a high-performing workforce` (Berger & Beger, 2018) and are critical for an organization´s sustainable competitive advantage (Lewis & Heckman 2006; Collings & Mellahi 2009; Hartmann, Feisel, & Schober, 2010; Tarique & Schuler, 2010) and for increasing the performance of an organization and its success (Nijs Gallardo-Gallardo, Dries, & Sels, 2014; Gallardo-Gallardo, Dries, & González-Cruz, 2013; Berger & Berger, 2018). They are

often difficult to copy, imitate or to substitute. 'Talent consists of those individuals who can make a difference to organisational performance either through their immediate contribution or, in the longer-term, by demonstrating the highest levels of potential' (CIPD 2017, p. 1). Talent comprises all personal abilities, character, drive, knowledge, attitudes and potential to learn and grow (Michaels, Handfield-Jones & Axelrod 2001). Talent are individuals who perform outstandingly in one or more domains of human functioning, who are noticeably better than their counterparts and who permanently act at their personal best (Nijs et al. 2014, p. 182). However, one of key organizational challenges nowadays seems to be a significant talent shortage (Cappelli 2008; Collings & Mellahi 2009), so organizational capacity to attract, develop and retain talents, turns out to be an essential feature of the corporate strategy (Tarique & Schuler, 2010).

Introduction of the concept of talent management is usually linked to the McKinsey`s Report *"The War for Talent"* published in the late 1990s. Since then, the concept of TM has gained huge popularity among scholars and practitioners (Lewis & Heckman 2006; Cappelli, 2008; Iles Chuai, & Preece, 2010; Collings & Mellahi 2009; Shen & Hall, 2009; Farndale, Scullion & Sparrow, 2010; Caplan, 2010; Joyce & Slocum, 2012; Stahl, Bjorkman, & Farndale, 2012; Al Ariss, Cascio & Paauwe, 2014; Claussen Grohsjean, Luger, & Probst, 2014). Managing talents assumes 'an organization's efforts to systematically attract, identify, develop, and retain skilled and valuable employees – talents`, either in view of their 'high potential' for the future or because they are fulfilling business/operation-critical roles" (Campbell & Smith, 2010, p. 2). As such, talent management is concerned with all the HRM processes, with a precise focus on the attraction, development and retention of talents (Lewis & Heckman, 2006).

However, in the relevant literature different perceptions and insights of talent management can be found. According to Iles et al. (2010) and Capelli (2008) there are at least three different ways of understanding of talent management. Firstly, some authors are viewing it as a rebranding term of HRM with a strategic focus in all HRM activities. Secondly, talent management is often understood as focused only on talented people - talent pool, both internally and externally to the organization, by using HRM instruments. Finally, talent management may be viewed as

focused on talent flows - management of talent progression within an organization rather than on the talent pool.

2. The need for promoting gender-responsive talent management in policing

Having in mind complexity and importance of the role that police have in societies today, they urgently need to think about the skills and talent they require across their organisations to deliver against the ambitions of the police reform agenda and to improve the lives of the communities they serve, as well as to identify the skills gaps and how they will address these. This will require police forces to focus on talent management and leadership at all levels across their organisations. Given the focus on community empowerment, it will be vital that those working in the front-line in localities and neighbourhoods are developed, supported and empowered to work in different ways to support individuals and communities to improve their life outcomes.

However, some studies (Gadseden et al., 2017) suggest that within public services, in general, still there is no to be a shared consensus on the definition, scope or nature of talent management, and that only a few organisations have adopted an exclusive approach focusing on a small number of individuals, and instead are favouring an inclusive approach, developing talent with a broad based focus on skills development to meet future organisational needs, seeing talent management simply as a re-labelling of current learning and development provision. Further, even smaller number of organisations has a talent management strategy in place, since the talent management is more likely to be of peripheral concern, rather than a central component within organisational strategic/business plan.

When we think about police forces, additional concern appears to be of importance. That is certainly gender equality, which seems to be traditionally undermined, regardless of a large number of various regulations that promote gender equality at both levels national and international.[1] There are many national and international studies that indicate that women and men are equally capable of conducting police work effectively; even more, studies indicate that women often bring a certain set of skills and strengths to police work, including the ability to minimize the use of, or reliance on, force when dealing with a belligerent person(s), the ability to act as role models to community members, better communication skills than their male counterparts, and capacity to facilitate the cooperation and trust required to implement a community policing model (Lonsway et al., 2003, p. 22; Bezuidenhout, 2001, p. 7)

A modern police service must be able to respond to evolving threats to security and novel types of crime, the reason why it should attract the most capable and motivated personnel for the job – encompassing a wide variety of skills and abilities needed for modern policing. In order to recruit the most competent candidates, the police should attract personnel from the widest possible pool of candidates, included women. In order to address the needs of the population as a whole, a police service has to be representative of the society it serves. Therefore, stronger gender equality leads to better efficiency and effectiveness of police work.

However, within police force gender inequalities appear to be even larger and more evident. The female officers often indicate significantly lower levels of equal opportunity perceptions and their quality leadership, more reasons for career opportunity differences (particularly discrimination), more sexual harassment and consequently less job satisfaction, and lower professional efficacy than did male officers (Burke & Mikkelsen, 2005). Moreover, gender equality plans often have objectives that are difficult to evaluate, the reason why they over and over again remain free of any real obligation (Van den Brink & Benschop, 2017). For example, in South Eastern

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[1] One of the most influential documents that deal with the issues of preventing discrimination against women is *The Convention on the Elimination of All Forms of Discrimination Against Women* (so-called CEDAW). States members of the UN have undertaken the legal obligation to conduct *The Convention on Human Rights* as well as to realize specific goals. In 2000, the United Nations

Security Council adopted the *Resolution 1325 on women, peace and security,* which ensures the full participation of women in all aspects of decision making and peace-building process as well as in security sectors. On the other hand, in Europe, the European integration process implies harmonization of national legislation with the European Union regulations and directives on equal opportunities and non-discrimination, such as the *Directive 2006/54/E3* on the implementation of the principle of equal opportunities and equal treatment of men and women in matters of employment and occupation, EU Council Directive 2000/78 on discrimination, as well as with the conventions of the European Union and the Council of Europe (The Council of Europe Declaration on gender equality as the fundamental demographic principle, The European Convention on Human Rights, etc.).

European countries studies show that overall, including civilian personnel, women represent between 10.7% and 29.9% of employees of police services only, whereas only a few women occupy top or senior level positions in police services and most of the uniformed and commissioned women hold lower level positions (SEESAC, 2015). Altogether, these facts draw attention to the necessity of decreasing gender equalities within HRM practices and promoting gender-responsive talent management in police organisations.

3. Proposing strategic HRM measures for advancing gender-responsive talent management in policing

Decreasing gender inequalities attracted enormous attention of numerous academics for many years (Calás & Smircich, 2009; Eriksson-Zetterquist & Renemark, 2016; Nentwich, 2006; Williams, Muller, & Kilanski, 2012; Stamarski, 2015; Blau & DeVaro, 2007). However, refusal to accept such change, as Van den Brink & Benschop (2017) suggested, has been often confirmed by various research studies (Benschop & Verloo, 2006; Wasserman, Gallegos, & Ferdman, 2008; Lee-Gosselin, Briere, & Ann, 2010; Lombardo & Mergaert, 2013).

Even though many attempts to developing gender-balanced HRM practices fail to succeed, still we believe that promoting and achieving gender-balanced talent management in policing with demonstrable economic contribution to the organization's bottom line is possible, but it requires the following (Edwards, Scott, & Raju, 2007): (a) developing specifically designed gender-balanced talent management programs/measures in policing, (b) considering those programs as high HRM priority in policing, and (c) ongoing evaluation of those programs on the basis of quantitative indicators. Such HRM measuring has to become one of the regular activities of HRM specialists in policing, as they can document HRM's contribution to organizational success only by becoming more quantitative oriented (Fitz-enz, 1995, 2000; Becker, Huselid & Ulrich, 2001). In this way it is possible to improve HRM activities, particularly talent management initiatives and practices, to demonstrate that HRM is a strategic partner in police organizations, and to provide evidence that HRM activities impact and contribute to the police organizations` vision, mission and goals, leading to greater organizational performance and

competitive advantage (Schuler & MacMillan, 1984; Sparrow, Schuler, & Jackson, 1994; Pfeffer, 1995; Guthrie Flood, Liu, & MacCurtain, 2009).

In this paper, under the term of „the gender-responsive talent management in policing" we assume talent management in policing with a strategic focus in attracting, developing, and retaining talented people in a way which highly values gender equalities. In the following sections we propose various measures aimed at advancing gender-responsive talent management in policing.

Strategic focus. In order to advance gender-responsive talent management, the police organisations need firstly to design and adopt a talent management strategy, as a key part of the overall HR strategy, and Guidelines on gender equality measures in policing. A talent management strategy will help in understanding the skills, experience and capabilities the police organisation needs to deliver its strategic objectives and business plans. By reviewing staff and their roles it is possible to understand the current state of the organisation and mapping this onto organisational future requirement. A gender-responsive talent management strategy should provide for a gender-balanced recruitment in police careers and management positions through a higher level of participation and more opportunities for women's career advancement by implementing equal opportunity policy and affirmative action measures, as well by creating equal opportunities for education, employment, career guidance and counselling, career advancements for women and men at all levels of education and security specializations – and therefore the police education systems, especially for leadership positions.

From an employer perspective, implementation of a talent management strategy can bring significant benefits: ensures that the leadership of the police organisation is rich and diverse, reflecting the particular society; helps in achieving strategic business objectives; builds a high performance workplace; encourages a culture of learning and development; ensures value for money through targeting talent spend and ensuring talent is coherently managed; addresses diversity issues, and to eradicate direct and indirect discrimination; engages people; retains talented people, and enhance the police organization image and position in the employment market. From an individual employee perspective there are also real

advantages to investing in talent management strategies: engage with their work and be more effective; become satisfied with their jobs and proud of their organisation; recommend the police force as a good employer; have a good opinion of their managers; feel that their performance is valued; have stronger feelings of personal and professional growth and accomplishment; feel

valued and important to the success of the organization.

In Table 1 we propose various HR measures (and specific HR indicators) at the strategic level to create a gender-responsive environment in policing in order to attract, develop and retain a required talented workforce in a way that promotes gender equality.

Table 1 Designing gender-responsive and TM oriented HR strategy, policies, and practices in policing

Measures/Activities	Indicators	Responsible
Defining talents and talent management in police. Developing and including talent management strategy (vision, values, goals, means) as a central component of the overall HR strategy.	-formal definition of talents and talent management in police has been adopted; -talent management strategy has been adopted as part of HR strategy.	Director of Police Executive police officers Director of HR department
Adoption and implementation of the guidelines on gender equality implementation measures and goals (the Guidelines) and inclusion of gender responsive objectives in relevant strategic documents.	-the Guidelines has been adopted; -Gender-sensitive objectives included in both the business strategy and HR strategy of the police organization.	Director of Police HR Director
Developing a protocol guideline on sexual harassment treatment and gender based discrimination.	-adoption of the procedure; -annual No. of reported cases; -No. of processed cases during the year; -average duration of the procedure; -No. of the imposed measures/orders.	Director of Police, HR Director, Legal Department
Formation of the Gender Equality Council in the police in order to define and implement the gender equality policies and appointing an adviser suitable for internal communication and equal opportunity policies.	-the Gender Equality Council has been formed. -Gender adviser appointment decision has been signed.	Director of Police
Supporting female police associations as a venue for advocacy, support, sharing of experiences and the learning of lessons on how to cope and excel in a police environment.	-No. of police female associations; -No. of shared initiatives, meetings, etc.	HR Department Adviser for internal communication and equal opportunity
Mandatory annual monitoring and reports on the implementation of gender equality, and providing the measures for improvement.	-annual gender equality report, including the indicators of all the HRM areas with special attention drawn to talent management practices, and precise improvement measures.	Adviser for internal communication and equal opportunity

Source: The author

Attraction. Attracting talented people to the police force with respect to gender equality is a first task of a gender-responsive talent management strategy. The talent pool in police organisations possibly will include a group of people who have special personal traits, abilities, attitudes, drive, adequate knowledge and potential to learn and grow and are source of future senior executive positions. Attracting them assumes at least three groups of activities: recruitment (internal and external), selection end employer branding. Recruitment and selection should provide for the attraction of best candidates for the police jobs on the basis of wide recruitment campaign, use of multiple recruitment methods in order to attract more talented female candidates, realistic job descriptions and variety of selection

tests to identify the best candidates for the opened job postings. Since job descriptions guide the recruitment process, they need to be realistic and updated to accurately reflect the knowledge and abilities required in modern policing, such as: ability to communicate with diverse community members, knowledge of the value of cultural diversity, ability to de-escalate violent situations, ability to mediate disputes, ability to work cooperatively with community groups, ability to develop and prioritize solutions for crime and community day-to-day life problems, ability to empathize with those holding different values, ability to work cooperatively with other governmental and social service agencies, ability to identify proactive measures to prevent problems and improve community life conditions,

ability to handle conflicting priorities. Job descriptions for key roles and managerial positions in police organisations should also reflect needed knowledge, skills, and experience in order to attract more female talents. In addition, through redesigning jobs in policing, as some studies show (Hernaus, Tadić Vujčić & Aleksić, 2017), work engagement of public-sector employees may be significantly enhanced.

In order to recruit the best candidates externally, the police organisation should dedicate sufficient attention to developing its image as a good and credible employer in public. Good employer image may additionally further and increase the employee value proposition, i.e. an employee`s perception of the value of the organisation seeking to recruit him in relation to variety of jobs, work environment, training opportunities, flexibility and reputation of the organisation (Kargwiria Iyria, 2013). Public awareness of an organization and strength of its branding as an employer may present a great

talent magnet and put control of the number and type of job candidates into the hands of the employer (Schiemann, 2018, p. 30).

In order to provide for timely recruiting, cost savings, better access to a large number of candidates, easier targeting of potential candidates, faster responses and information exchange and ease of use, police organizations should use more intense the Internet and social networks for recruiting purposes (Cappelli, 2001; McFarland & Ployhart, 2015; Parry & Tyson, 2008; Slavić, Bjekić & Berber, 2017). Regarding the selection process, the role of the Internet and social networks is important, but not crucial, since the role of traditional selection methods is still important in making selection decisions (Slavić, Bjekić & Berber, 2017, p. 42).

In Table 2 we put forward several measures and indicators we believe that will encourage and move forwards the police forces to attract more female talents, both internally and externally.

Table 2 Attracting more female talents to police force, internally and externally

Measures/Activities	Indicators	Responsible
Reassessing job descriptions and person specifications of key roles and available managerial job positions in police sectors in order to modify and increase the value of knowledge and skills diversity, capabilities and previous experience; in this way, not only men would be chosen for these positions but women as well.	-No. of reassessed key roles and managerial job positions' specifications; -No. of applicants/ applied men and women, and number of the received applicants; -No. of applicants (men and women) who fulfil the requirements.	Director of Police Job analyst Recruitment department OD department
Making a recruitment campaign information guide that is focused on realistic job descriptions, needed personal skills, knowledge, attitudes and abilities, position responsibilities, risks and specific features of police services, career progression opportunities and advantages of police service.	-printed recruitment campaign information guide.	Recruitment department OD department
Implementation of Affirmative recruitment	-No. of the implemented internal and external affirmative job competitions during the year; -No. of different methods of affirmative recruitment implemented during the year; -No. of the applicants, in terms of gender, attracted by different recruitment methods.	Recruitment Department
Implementation of the external recruitment campaign strategy aimed at attracting talented women to join the police, including the following: social networks, schools, TV, female print media, camps, workshops in cooperation with women's associations, citizens' associations, local self-governments, traditional women's schools, etc.	-No. of the promotional campaigns organized in schools during the year; -No. of times women in policing appear on TV shows during the year; -No. of newspaper articles during the year; -No. of organized camps and workshops during the year; -No. of women's schools with which cooperation was established; -No. of women's associations with which cooperation was established.	Recruitment department, Adviser for internal communication and equal opportunity
Internal and external competition panels should have at least 30% of the less represented gender.	-No. of panel members in terms of gender,	Recruitment department
Training courses organized for the panel members in relation to gender discrimination and recognition of	-No. of the panel members who took part in trainings.	Adviser for internal communication and

talents.		equal opportunity, Training department
Affirmative measures should be applied whenever it is possible, which means in case of two equally ranked candidates, the candidate belonging to less represented gender has advantage	-No. of cases in which the affirmative method was applied; -No. of employed women and men in term of fixed-term employment contracts and indefinite term contracts, including some other criteria.	Adviser for internal communication and equal opportunity, Recruitment department
Detailed analysis of adequacy of tests and interview questions and results in order to promote more efficient recognition of talents and to avoid discrimination factors.	-No. of women and men who fulfilled the test criteria; -No. of different tests used.	Recruitment department

Source: The author

Learning and development. One of key activities of talent management is to provide learning and development to recognized talent groupings. Learning and development is oriented towards improving individual and organisational performance through developing employee capability to underpin organisational effectiveness. The required skills and capabilities need to be articulated in a competency framework, which reflects current and future skills and behavioural needs of the organisation, often at different levels: core competencies, functional competencies and leadership competencies. These can then be used in recruitment processes, in talent management and in career development and promotion decisions. The core competencies are the baseline and for every role in an organisation it would be required to specify the level to be successful in that role. This should make easier to create a talent succession plan that defines the roles, as well as the prerequisite capabilities and responsibilities for those roles. Within police force learning and development practices should value gender equality and should promote greater availability and therefore higher involvement of female talents. In Table 3 we proposed various measures to promote and improve gender responsive learning and development in police.

Table 3 Promoting gender responsive learning and development in police organisations

Measures/Activities	Indicators	Responsible
Design a competency framework, which reflects current and future skills and behavioural needs of the police, at different levels: core competencies, functional competencies, leadership competencies.	-a competency framework designed and adopted	OD department
Developing a talent succession plan that defines the roles, responsibilities and, prerequisite capabilities for various responsibilities and roles as well as demonstrated capabilities needed for advancement.	-Talent succession plan adopted.	OD department
Performing a talent (skills, competencies) gap assessment as the baseline for determining near-term competencies and actions that need to occur to shore up immediate gaps and guide long-term talent investments.	-no. of talents not having necessary skills (competencies) according to feedback from performance reviews, interviews, surveys or skills management software (for example, TrackStar or Skills DB Pro); -list of skills (competencies) needed improvement in near term; -list of skills (competencies) needed improvement in long term.	OD Department
On the basis of talent gap analysis, developing, implementing and monitoring development programs targeted to recognized groups of talents in police.	-development programs targeted to the needs of all recognized talent groups; - No. of managers, in terms of gender, who attended the training during the year.	OD Department
Implemented training program in relation to gender based discrimination and sexual harassment, as well as mandatory	-No. of managers, in terms of gender, who attended the training during the year.	OD department Adviser

implementation of the program within the management training program.		
Establishing a standard orientation program for the newly employed, including a special part for orientation of female candidates for encouraging them to apply for uncommon sectors	-No. of women applied for the sectors which traditionally hire less female employees.	Training department Recruitment department
Applying different training formats for different talent groups based on specific needs: in-house courses, external trainings, conferences and events, educational qualifications, books and journals, coaching by line managers or peers, mentoring, job rotation, work shadowing and secondments, action learning, e-learning, blended learning, etc.	-No. of participants per training format; -No. of training formats available to women.	Training department
The list of mentors includes at least 30% female mentors	-mentorship in terms of gender, on annual basis.	Training Department
Realization of the mentorship program in order to ensure equal availability of mentoring support for both women and men, including a specially designed mentorship program for the women employed in the sectors where they represent a traditional minority	-No. of mentorship program users in terms of gender; -No. of women employed in untypical sectors using mentoring support; -No. of women who remained/left the sector after having used mentorship support.	Training Department
Mentoring trainings in relation to gender based discrimination and additional support measures for women employed in police sectors.	-average No. of training hours per mentor.	Training Department
The key indicators on target gender structure of the employees are included in the managers performance evaluation form (strategic, high, medium and operative management level)	-implemented gender indicator in the managers performance evaluation forms.	OD Department
Monitoring the assessment of the employees in relation to gender, in order to find out potential inequalities in the evaluation procedures.	- gathered information about the evaluation of the employees, in terms of gender, sectors and job positions.	OD department

Source: The author

Retaining. Talents retention assumes taking measures and actions to convince employees to remain in the organization as long as possible, since talent turnover may produce high costs due to lost productivity, reduced performance levels and high attraction costs. Within police force the main retaining objectives in order to keep female talents is to provide for pay equity, benefits and flexible working practices that allow women to balance their business and private lives. Therefore, in Table 4 we propose several measures to advance retaining more female talents through pay and flexible working practices in police.

Table 4 Retaining more female talents in police through compensation and flexible working practices

Measures/Activities	Indicators	Responsible
Continuous annual monitoring report on the amount of total earnings (salary, benefits, variable earnings) of police officers in terms of gender, in order to identify differences and define the methods for reducing wage inequalities between women and men.	-facts about salaries divided into gender, ranks, managerial positions; -identified wage inequalities between women and men; -suggested and approved pay gap reduction methods.	Compensation & Benefit department
Monitoring report on monthly earning stimulation based on gender.	-structure and No. of employees, in terms of gender, who are given monthly stimulation during the year; -average amount of monthly salary increase, in terms of gender, on an annual basis.	Compensation & Benefit department
Monitoring report and analysis of the amount of the initial earnings of the newly employed, in terms of gender.	-structure of initial earnings of the newly employed in terms of gender.	Compensation &Benefit department
Measures to increase paternity leave due to childcare issues, in case when both parents	-employees' structure in relation to the gender using absence from work due to childcare issues.	Compensation & Benefit department

are employed in policing		
Develop support measures for returning to work after the absence from work due to childcare.	-No. of different measures applied in practice.	OD department Compensation & Benefit department
Analysis of the reasons for leaving the organization; creating a support package for leaving preventing.	-structure and No. of the employees in terms of gender who leave their jobs after having taken the leave of absence due to childcare issues (including the number in accordance with the program dealing with redundancy solving).	Employee relations department
Preventing the return to lower job positions – dealing with superiors.	-job positions the employees return to after the leave of absence, in comparison to the positions they used to have before taking the leave of absence, in terms of gender.	OD department
Increase predictability and regularity of shift works so that women and men are able to coordinate their parental responsibilities	-changes in relevant acts; -No. of men and women having children and working in shifts, and the level of their satisfaction with the shift work organization in relation to parenting.	Compensation and benefits department Employee Relations department
Implementation of flexible working practice (flexible working hours, work from home employment, compressed working week...) within organisational sectors in which such work schedule is possible to implement, depending on the type of jobs.	-structure and No. of employees in terms of gender, length of service and organisational sector using flexible work practice (flexible work hours, compressed week, work from home, etc.)	Employee Relations department

Source: The author

Conclusion

In this paper we attempt to shed light on the importance of promoting and advancing gender-responsive talent management in a modern police service. We propose a various measures (and indicators) for advancing strategic focus in attracting, developing and retaining more female talented candidates in police service, since we believe that talent management (as well as other HRM initiatives and activities) would be taken for serious and really implemented within police organisations only if there is a formalized system with designed measures and indicators needed to be monitored and evaluated on a continuous basis. We expect that such an approach to talent management in police organisations can significantly contribute to future talent management research and practice in policing through the following: (1) by linking directly strategy and talent management in policing, (2) by providing gender balanced recruitment, development and retention in police careers and management positions, (3) by fostering a long-term irreversible modification of behavioural patterns leading to the reproduction of gender inequalities in policing. In studying talent management in police organisations the challenges such as engagement, skills gap and talent shortage, technology acceleration and transparency may be of significant importance for future investigations. SM

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Navy Ability Development Strategy using SWOT Analysis-Interpretative Structural Modeling (ISM)

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Abstract
Indonesia as an archipelagic country has potential problems that pose a threat. This can be inferred because of the security lack and the sovereignty in the sea border area. The aim of the paper is to formulate a development strategy of posture capabilities of the Indonesian Navy to encounter security threats in the national territorial waters. In this research using the integration of SWOT analysis method and Interpretative Structural Modeling (ISM) in formulating strategies of Indonesian Navy posture capability development. The result of this paper Based on SWOT analysis, the total strategy that has been formulated is 10 (ten) sub strategies which determine the development of the Navy posture abilities. Based on ISM Method, it is evident that Increase of state budget percentage for the maritime sector in the development of Navy capability and other stakeholders as (ST)1 is a significant driver for the development of the strategy. Utilization of the abundant labor force in recruitment of Navy Personnel as (SO)2 is at level II; Build a strong foundation and infrastructure of information systems in the maritime territory to cope the cyber threats as (ST)3 and Cooperation with developed countries with technology transfer for military infrastructure development as (WT)2 are at level III; Negotiations with neighboring countries in trans-state sea border agreements as (ST)2 is at level IV; Establish an integrated task force with fellow stakeholders in maritime security as (WO)1 and Establish a task force to eradicate corruption and illegal levies on marine sector as (WO)2 are at level V; Utilization of marine resources to support renewable energy at sea, and open employment for the community as (SO)1 is at level VI. Equitable development of maritime infrastructure and connectivity in coastal and border areas as (WT)1 and The use of the country's active-free politics as a mediator for China and US hegemony in Asia Pacific as (SO)3 are at the top of the hierarchy models of structural modeling based on interpretation. The key strategy is an increase of state budget percentage for the maritime sector in the development of Navy ability.

Keywords
Posture of Indonesian Navy, SWOT Analysis, Interpretative Structural Modeling (ISM)

Introduction

Indonesia as an archipelagic country has potential problems that become a threat in the national territorial waters (Putra, Hakim, Pramono, & Leksono, 2017). The threats include violations of law covering armed robberies, human smuggling (illegal immigrants), smuggling of goods, illegal fishing, marine pollution, illegal exploration and

exploitation of natural resources, as well as other violations in water areas (Poerwowidagdo, 2015). On the other side, the Indonesian Navy (TNI AL) is a main component to protect maritime security (Susilo, Ahmadi, Suharyo, & Pratisna, 2017). The TNI AL posture is structured on the basis of several components in the integrated fleet weapon system, consists of: Warship, Airplanes, Naval Base and Marine Corps (Yogi, Rizal, Ahmadi, & Suharyo, 2017).

The aim of paper is to formulate a posture of Indonesian navy development strategy to encounter the threat of national maritime security. This paper uses integrating SWOT analysis and Interpretative Structural Modeling (ISM) to formulate the development strategy. SWOT analysis uses to identify and formulate some strategy of Navy posture capability. ISM method uses to identify and map relationships between strategies.

To support the research, this paper has many literatures. SWOT analysis uses to applying the priority model of engineering faculty development strategy (Živković, Nikolić, Djordjević, Mihajlović, & Savić, 2015). SWOT analysis to formulate the development strategy of traditional shipyard industry (Lumaksono, 2014). SWOT analysis to provide an appropriate strategic analysis to plan the relocation of the naval base (Yogi, Rizal, Ahmadi, & Suharyo, 2017). SWOT to prioritization of strategy for viticulture development (Dibokić, Nikolić, Djordjević, Panić, & Živković, 2017).

The literatures about Interpretative Structural Modeling (ISM). ISM for analyzing interactions between barriers to just-in-time (JIT) production operations (Jadhav, Mantha, & Rane, 2015). ISM to analysis of core industry competencies in Pekalongan City (Paramitha & Nurcahyo, 2018). ISM uses for identification of readiness in implementing business Intelligence project (Farrokhi, Pokorádi, & Bouini, 2018). ISM uses to identify the drivers of travel / tourism growth and build relationships between enablers (Roy & Misra, 2016). ISM uses to study various aspects and correlations between youth and sustainable rural development (Panackal & Singh, 2015).

This research is expected to contribute to the science of military operations research in the concept of strength development and ability.

This paper is organized as follows. Section 2 explains the basic concept the model of strategy development. Section 3 gives result of paper. Section 4 describes the analysis of development strategy for Indonesian Navy (TNI AL) posture. Section 5 presents the conclusion of paper.

1. Navy Ability (Posture of Navy)

The development of posture is projected towards a regional maritime with an active principle that is defensive. This posture is designed to address possible threats, actual problems, and to support defense forces. There are many components in the posture, such as (Ministry of Defence, 2015):

1. Strength.
   The main components of strength based on Integrated Fleet Weapon System consist of Warship, Airplanes, Naval Base and Marine Corps.
2. Capability.
   The capabilities of the Navy are designed for intelligence, diplomacy, defense, security, regional empowerment and support capabilities.
3. Deployment.
   The deployment of the Navy includes organization, strength and ability.
   This is aligned with the establishment of a fleet command organizational structure, including centralized, territorial and support unit strength.

2. Material/Method
2.1. SWOT Analysis

SWOT analysis is an effective strategic planning tool for analyzing the organization of internal and external influences (Gürel & Tat, 2017). SWOT analysis consists of internal and external factors. Internal factors (strengths, weaknesses) are used to test assets within an organization (Marić & Ilić, 2012). External factors are used (opportunities, threats) to investigate factors in the environment beyond the organizational control that affect organizational performance (Gürel & Tat, 2017), (Njoroge, Ongeti, Kinuu, & Kasomi, 2016). Information obtained can be integrated in different matrix combinations of the four factors in determining strategies for long-term progress (Yuksel & Dagdeviren, 2007; Živković, Nikolić, Djordjević, Mihajlović, & Savić, 2015).

The SWOT analysis shows the right strategy in four categories (SO, ST, WO and WT) (Dibokić, Nikolić, Djordjević, Panić, & Živković, 2017). Strength-Opportunity (SO), this strategy takes advantage of opportunities by using existing strengths. Strength-Threat (ST), this strategy uses the strength to eliminate or reduce the effects of

threats (Marić & Ilić, 2012). Weakness-Opportunity (WO) strategies are used to take benefit from opportunities by external environmental factors with fixing the weaknesses. Last, Weakness-Threat (WT) strategies are used to reduce an impact from threat with fixing the (Dibokić et al., 2017).

Table 1   Matrix of SWOT

INTERNAL/EXTERNAL FACTOR	STRENGTH (S) (Maximal)	WEAKNESS (W) (Minimal)
OPPORTUNITIES (O) (Maximal)	S-O strategy	W-O Strategy
THREATS (T) (Minimal)	S-T Strategy	W-T Strategy

Source: Malik, Al-Khatani, & Naushad, 2013.

2.2. Interpretative Structural Modeling (ISM)

The interpretative structural modeling (ISM) used for ideal planning, is an effective method because all elements can be processed in a simple matrix (Wang, 2015). ISM was first proposed by Warfield in 1973. The interpretative structural modeling is a methodology that aims to identify the relationship between a particular item, which defines a related problem or issue (Attri, Dev, & Sharma, 2013) and a suitable modeling technique for analyzing the influence of one variable on another variable (Solke & Singh, 2018).

ISM has been well proven to identify structural relationships among system-specific variables. The basic idea is to use practical experience and expert knowledge to parse complex systems into multiple sub-systems and build structured structural models (Firoz & Rajesh, 2012). The ISM-based approach is one of the versatile and powerful techniques that have been used to solve complex multi-factor problems. ISM is interpretative, since the group assessment selected for the study determines whether and how the related variables (Balaji, Velmurugan, Prapa, & Mythily, 2016). There are procedures or stages in the use of the ISM method, such stages as :

1. Identify elements of a system. The system elements and sub-elements of the system are identified. This step can be done through research, brainstorming or other.
2. Development of Structural Self Interaction Matrix (SSIM).
   The development of an interpretive structural model begins with the preparation of a structural self-interaction

matrix, indicating the direction of the contextual relationship between elements.

Table 2   Rule of SSIM Development.

Symbol	Relationship between row (i) and Column (j) elements
V	Barrier j will lead to barrier i, not in reserve direction
A	Barrier i will lead to barrier j, not in reserve direction
X	Barrier I and j will lead to each other, in both directions
O	Barrier i and j are unrelated

Source: Malik et al., 2013.

3. Reachability Matrix.
   From the self-interaction matrix (SSIM), the relational indicator is converted to binary numbers 0 and 1 to obtain a square matrix, called the reachability matrix (Hussain, 2011).

Table 3   Sample of Reachability Matrix.

No	Code	Strategies	4	3	2	1
1			A	O	O	-
2			V	A	-	
3			V	-		
4			-			

Source: Hussain, 2011.

4. Partition level.
   The elements are classified into different levels of the ISM structure that will be formed. For this purpose, two devices are associated with each element in the system, namely reachability set (Ri) which is a set of elements that can be achieved by the element Ei, and antecedent set (Ai) which is a set of elements where the Ei element can be achieved.
5. The construction of interpretative structural modeling (ISM).
6. MICMAC analysis.
   MICMAC is used to check driving power and dependence power. Variables have been grouped into four criteria known as Autonomous, Linkage, Dependent and Driving / independent. The following is the meaning of the four categories (Panackal & Singh, 2016): a) Variable Autonomous. b) Linkage Variables. c) Dependent Variables. d) Independent Variables.

3. Conceptual Framework

Figure 1 Conceptual Framework of Research.
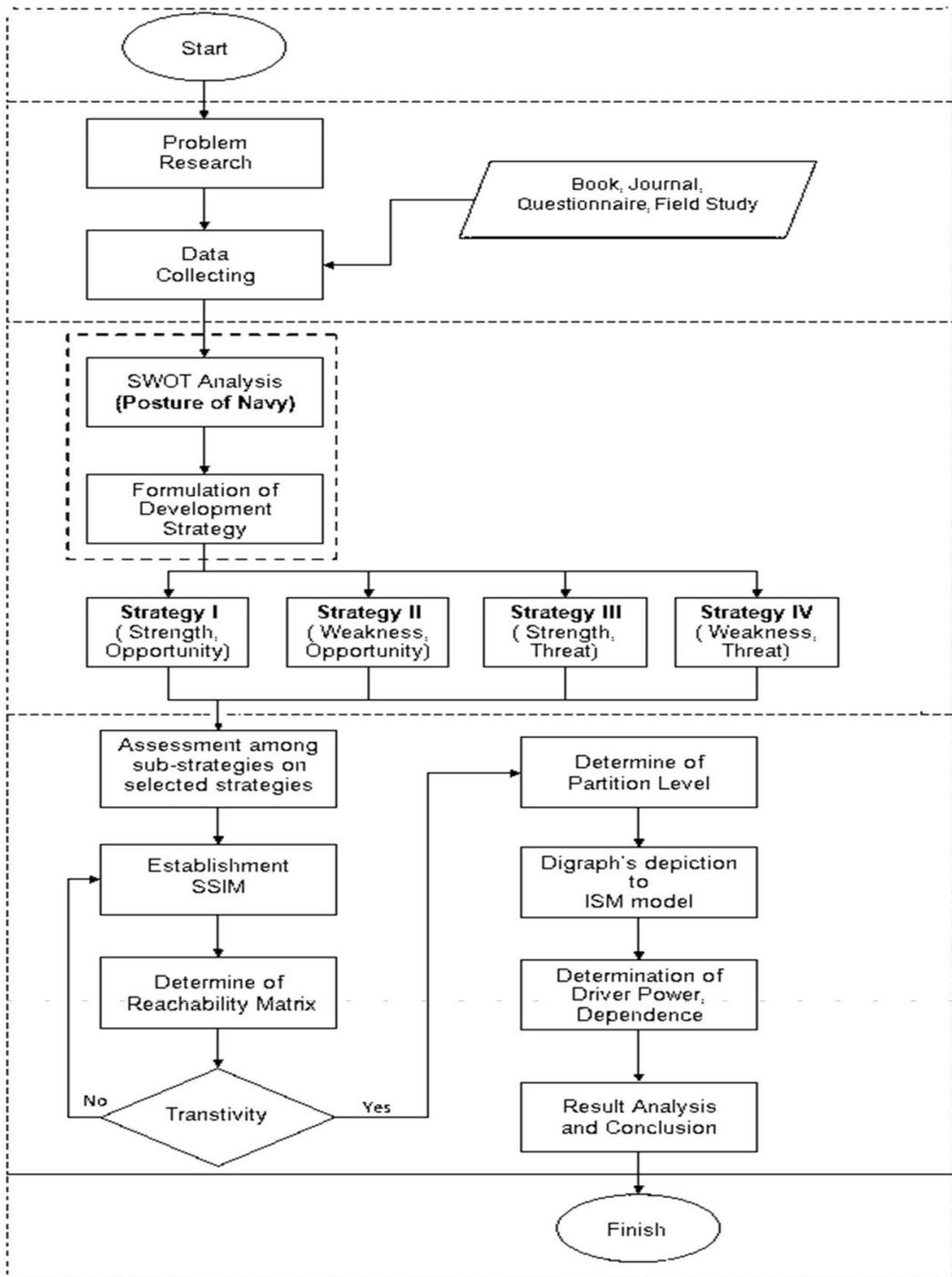**Source**: Author

4. Result
4.1. Strategy Formulation

The analysis of Navy ability development strategies using SWOT (Strength, Weakness, Opportunities and Threats) is maximizing Strength and Opportunities, while minimizing Weakness and Threats. The data taken from interviews and observations with six experts. The results of the SWOT analysis are described as follows:

Table 4 Result Of Internal And External Factor Identified.

Internal Factors	
Strength (S)	**Weakness (W)**
S1. Geographical position of Indonesia between two oceans and continents. S2. The number of main weapon system that many. S3. Character and history as a maritime nation. S4. The defense budget that continues to increase. S5. Demographic bonus of the population with a large workforce. S6. Maritime-oriented from the Government Policy. S7. Naval Diplomacy is good. S8. A Militant soldier.	W1. Maritime security policy that still overlap with other stakeholders. W2. Age of vulnerable weapon system and technology that still lag. W3. Maritime domain awareness is minimized. W4. Defense budget mostly for soldier's salary. W5. Information systems are still vulnerable to attacks from cyber enemy. W6. Inadequate naval base infrastructure. W7. Welfare for the Personnels of the Navy is limited.
External Factors	
Opportunity (O)	**Threat (T)**
O1. Indonesia has the opportunity to become the second largest maritime country in the world. O2. As a new hegemony in Asia-pacific, a counterweight of China and US influence. O3. The high economic growth encourages the growth of goods traffic by sea. O4. A good national state budget encourages increased strength for the Navy ability. O5. Demographic bonus as a large market and abundant labor for the Navy. O6. The existence of technology transfer for maritime service industry. O7. Participate in the determination of world maritime security policy as a member of IMO.	T1. Piracy. T2. Illegal immigrants and human trafficking. T3. Drug trafficking, smuggling of goods, weapons and military technology. T4. The threat of terrorism both from inside and outside the country. T5. Armed attacks, and violations of territorial boundaries from other countries. T6. The threat of cyber attack; espionage; sabotage. T7. Hunting and looting of marine resources, and illegal fishing. T8. Communal conflict. T9. Threats from loss of natural resources and outer islands.

Source: Data Analytic from Author

Based on the results of respondents' judgement, there are several internal factors that become strengths and weaknesses as contained in the table upon. It has eight points for strength analysis factor and seven points for weakness analysis factor. It has seven points for opportunity analysis factor and nine points for threat analysis factor.

Table 5 Result of Strategy.

Strategies	
Strength-Opportunity (S-O)	**Weakness-Opportunity (W-O)**
(SO)1. Utilization of marine resources to support renewable energy at sea, and open employment for the community. (SO)2. Utilization of the abundant labor force in recruitment of Navy Personnel. (SO)3. The use of the country's active-free politics as a mediator for China and US hegemony in Asia Pacific.	(WO)1. Establish an integrated task force with fellow stakeholders in maritime security. (WO)2. Establish a task force to eradicate corruption and illegal levies on marine sector.
Strength-Threat (S-T)	**Weakness-Threat (W-T)**
(ST)1. Increase of state budget percentage for the maritime sector in the development of Navy capability and other stakeholders. (ST)2. Negotiations with neighboring countries in trans-state sea border agreements. (ST)3. Build a strong foundation and infrastructure of information systems in the maritime territory to cope the cyber threats.	(WT)1. Equitable development of maritime infrastructure and connectivity in coastal and border areas. (WT)2. Cooperation with developed countries with technology transfer for military infrastructure development.

Source: Data Analytic from Author

The formulated strategy consists of 4 categories namely Strategy I (Strength-Opportunity), Strategy II (Weakness-Opportunity), Strategy III (Strength-Threat), Strategy IV (Weakness-Threat). Strategy I consists of 3 strategies. Strategy II consists of 2 strategies. Strategy III consists of 3 strategies. Strategy IV consists of 2 strategies.

Table 6 Strategy Collected.

Strategies	Symbol
Utilization of marine resources to support renewable energy at sea, and open employment for the community	**(SO)1**
Utilization of the abundant labor force in recruitment of Navy Personnel	**(SO)2**
The use of the country's active-free politics as a mediator for China and US hegemony in Asia Pacific.	**(SO)3**
Increase of state budget percentage for the maritime sector in the development of Navy capability and other stakeholders	**(ST)1**
Negotiations with neighboring countries in trans-state sea border agreements.	**(ST)2**
Build a strong foundation and infrastructure of information systems in the maritime territory to cope the cyber threats.	**(ST)3**
Establish an integrated task force with fellow stakeholders in maritime security.	**(WO)1**
Establish a task force to eradicate corruption and illegal levies on marine sector.	**(WO)2**
Equitable development of maritime infrastructure and connectivity in coastal and border areas.	**(WT)1**
Cooperation with developed countries with technology transfer for military infrastructure development.	**(WT)2**

Source: Data Analytic from Author

Based on SWOT analysis, the total strategy that has been formulated is 10 (ten) sub strategies which determine the development of the Navy posture abilities. At a later stage the strategies will be modeled in the ISM method (table 6). The first step in ISM processing is to create Structural Self Interaction Matrix (SSIM), where the variables make their contextual relationship by making one variable i and variable j.

4.2. Interpretative Structural Modeling (ISM) Method

Table 7 Structural Self Interaction Matrix (SSIM).

No	Code	Strategies	10	9	8	7	6	5	4	3	2	1
1	**(SO)1**	Utilization of marine resources to support renewable energy at sea, and open employment for the community	O	A	V	V	O	V	A	O	O	-
2	**(SO)2**	Utilization of the abundant labor force in recruitment of Navy Personnel	O	O	A	A	A	O	V	A	-	
3	**(SO)3**	The use of the country's active-free politics as a mediator for China and US hegemony in Asia Pacific.	V	V	O	V	O	O	V	-		
4	**(ST)1**	Increase of state budget percentage for the maritime sector in the development of Navy capability and other stakeholders	A	A	A	A	A	O	-			
5	**(ST)2**	Negotiations with neighboring countries in trans-state sea border agreements.	O	V	A	A	O	-				
6	**(ST)3**	Build a strong foundation and infrastructure of information systems in the maritime territory to cope the cyber threats.	X	A	A	A	-					
7	**(WO)1**	Establish an integrated task force with fellow stakeholders in maritime security.	O	O	X	-						
8	**(WO)2**	Establish a task force to eradicate corruption and illegal levies on marine sector.	O	O	-							
9	**(WT)1**	Equitable development of maritime infrastructure and connectivity in coastal and border areas.	V	-								
10	**(WT)2**	Cooperation with developed countries with technology transfer for military infrastructure development.	-									

Source: Data Analytic from Author

The second step is to make the reachability matrix (RM) by changing V, A, X and O with numbers 1 and 0.

Table 8 Reachability Matrix

No	Code	Strategies	1	2	3	4	5	6	7	8	9	10	Driving Power
1	**(SO)1**	Utilization of marine resources to support renewable energy at sea, and open employment for the community	1	0	0	0	1	0	1	1	0	0	4
2	**(SO)2**	Utilization of the abundant labor force in recruitment of Navy Personnel	0	1	0	1	0	0	0	0	0	0	2
3	**(SO)3**	The use of the country's active-free politics as a mediator for China and US hegemony in Asia Pacific.	0	1	1	1	0	0	1	0	1	1	6
4	**(ST)1**	Increase of state budget percentage for the maritime sector in the development of Navy capability and other stakeholders	1	0	0	1	0	0	0	0	0	0	2

5	(ST)2	Negotiations with neighboring countries in trans-state sea border agreements.	0	0	0	0	1	0	0	0	1	0	2
6	(ST)3	Build a strong foundation and infrastructure of information systems in the maritime territory to cope the cyber threats.	0	1	0	1	0	1	0	0	0	1	4
7	(WO)1	Establish an integrated task force with fellow stakeholders in maritime security.	0	1	0	1	1	1	1	1	0	0	6
8	(WO)2	Establish a task force to eradicate corruption and illegal levies on marine sector.	0	1	0	1	1	1	1	1	0	0	6
9	(WT)1	Equitable development of maritime infrastructure and connectivity in coastal and border areas.	1	0	0	1	0	1	0	0	1	1	5
10	(WT)2	Cooperation with developed countries with technology transfer for military infrastructure development.	0	0	0	1	0	1	0	0	0	1	3
		Dependences	3	5	1	8	4	5	4	3	3	4	40

Source: Data Analytic from Author

The next step is to make Canonical Matrix to determine the level through iteration.

Table 9 Iteration 1

No	Code	Reachability	Antecedent	Intersection	Level
1	(SO)1	1,5,7,8	1,4,9	1	
2	(SO)2	2,4	2,3,6,7,8,	2	
3	(SO)3	2,3,4,7,9,10	3	3	
4	(ST)1	**1,4**	2,3,4,6,7,8,9,10	4	I
5	(ST)2	5,9	1,5,7,8,	5	
6	(ST)3	2,4,6,10	6,7,8,9,10	6, 10	
7	(WO)1	2,4,5,6,7,8	1,3,7,8	7,8	
8	(WO)2	2,4,5,6,7,8	1,7,8	7,8	
9	(WT)1	1,4,6,9,10	3,5,9	9	
10	(WT)2	4,6,10	3,6,9,10	6, 10	

Source: Data Analytic from Author

From the Canonical matrix table above, it is found that the variable (ST)1 is the first iteration and the next Canonical matrix process is not included. Strategy (ST)1 at the first Level.

Table 10 Iteration 2.

No	Code	Reachability	Antecedent	Intersection	Level
1	(SO)1	1,5,7,8	1,9	1	
2	(SO)2	2	2,3,6,7,8,	2	II
3	(SO)3	2,3,7,9,10	3	3	
5	(ST)2	5,9	1,5,7,8,	5	
6	(ST)3	2,6,10	6,7,8,9,10	6, 10	
7	(WO)1	2,5,6,7,8	1,3,7,8	7,8	
8	(WO)2	2,5,6,7,8	1,7,8	7,8	
9	(WT)1	1,6,9,10	3,5,9	9	
10	(WT)2	6, 10	3,6,9,10	6, 10	

Source: Data Analytic from Author

From the Canonical matrix table above, it is found that the variable (SO)2 is the second iteration and the next Canonical matrix process is not included. (SO)2 at the level II.

Table 11 Iteration 3.

No	Code	Reachability	Antecedent	Intersection	Level
1	(SO)1	1,5,7,8	1,9	1	
3	(SO)3	3,7,9,10	3	3	
5	(ST)2	5,9	1,5,7,8,	5	
6	(ST)3	6, 10	6,7,8,9,10	6, 10	III
7	(WO)1	5,6,7,8	1,3,7,8	7,8	
8	(WO)2	5,6,7,8	1,7,8	7,8	
9	(WT)1	1,6,9,10	3,5,9	9	
10	(WT)2	6, 10	3,6,9,10	6, 10	III

Source: Data Analytic from Author

From the Canonical matrix table above, it is found that the variable (ST)3 and (WT)2 are the third iteration and the next Canonical matrix process is not included. (ST)3 and (WT)2 at the level III.

Table 12   Iteration 4.

No	Code	Reachability	Antecedent	Intersection	Level
1	(SO)1	1,5,7,8	1,9	1	
3	(SO)3	3,7,9	3	3	
5	(ST)2	5,9	1,5,7,8,	5	IV
7	(WO)1	5,7,8	1,3,7,8	7,8	
8	(WO)2	5,7,8	1,7,8	7,8	
9	(WT)1	1,9	3,5,9	9	

Source: Data Analytic from Author

From the Canonical matrix table above, it is found that the variable (ST)2 is the fourth iteration and the next Canonical matrix process is not included. (ST)2 at the level IV.

Table 13   Iteration 5.

No	Code	Reachability	Antecedent	Intersection	Level
1	(SO)1	1,7,8	1,9	1	
3	(SO)3	3,7,9	3	3	
7	(WO)1	7,8	1,3,7,8	7,8	V
8	(WO)2	7,8	1,7,8	7,8	V
9	(WT)1	1,9	3,9	9	

Source: Data Analytic from Author

From the Canonical matrix table above, it is found that the variable (WO)1 and (WO)2 are the fifth iteration and the next Canonical matrix process is not included. (WO)1 and (WO)2 at the level V.

Table 14   Iteration 6.

No	Code	Reachability	Antecedent	Intersection	Level
1	(SO)1	1	1,9	1	VI
3	(SO)3	3,9	3	3	VII
9	(WT)1	1,9	3,9	9	VII

Source: Data Analytic from Author

From the Canonical matrix table above, it is found that the variable (SO)1 is the sixth iteration. (SO)1 at the level VI. Variables (SO)3 and (WT)1 are the seventh iteration. (SO)3 and (WT)1 at the level VII.

The next step, create a model produced by the ISM to solve the problem, in this case the development of posture ability of the Indonesian Navy. From the model, then made implementation strategy based on level (level) that formed. This model can provide the process of the program or activities that will be done first to the final stage.

4.3. Discussion

The main purpose of the ISM method is to classify the elements under investigation, according to the driver and dependency. From Reachability matrix, it got the value of Driver Power (DP) and dependence value (D). Based on DP and D values, elements can be classified into 4 sectors:

1. The autonomous sector is a sector with low DP value and low D value. Elements that fall into this sector are generally unrelated to the system or have little connection.
2. The dependent sector is a sector with a low DP value and a high D value. Elements that fall within this sector are elements that are not free in the system and are highly dependent on other elements.
3. Linkage sector is sector with high DP value and high D value.
4. Independent sector is a sector with high DP value and low D value. Elements that fall in this sector can be regarded as a free element.
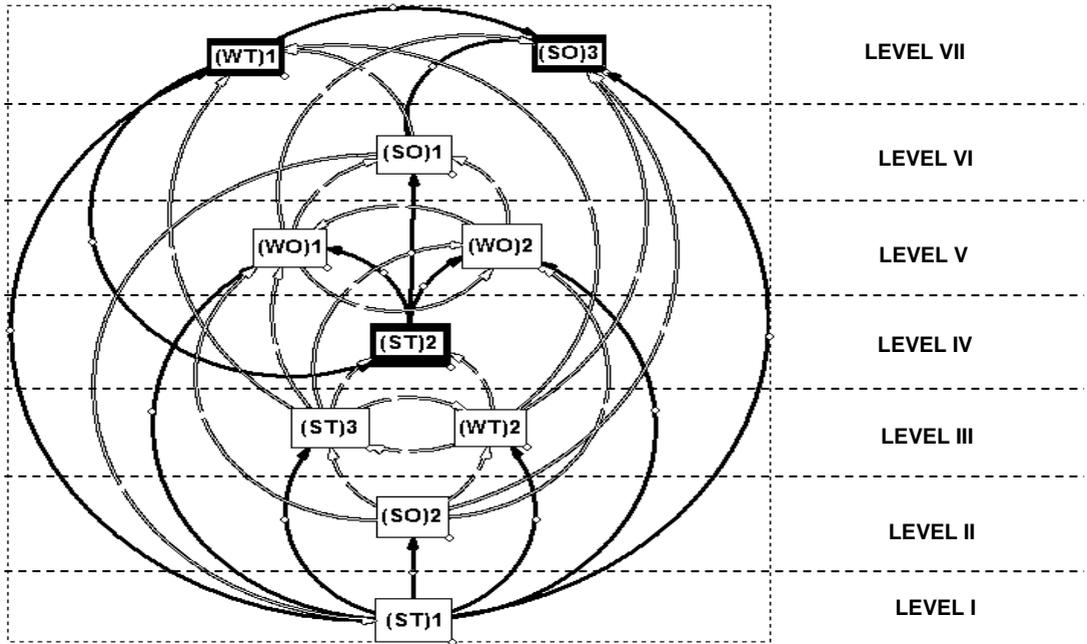
Figure 2 Structural Model of Navy Ability Development Strategy
Source: Data Analytic from Author

From the structural model of developing TNI AL posture, the model shows that (ST)1 is at level I. From Figure 3, it is evident that (ST)1 is a significant driver for the development of the strategy. (SO)2 is at level II; (ST)3 and (WT)2 are at level III; (ST)2 is at level IV; (WO)1 and (WO)2 are at level V; (SO)1 is at level VI. (WT)1 and (SO)3 are at the top of the hierarchy models of structural modeling based on interpretation. This model provides an analysis that the application can assist decision makers in determining the developing strategy of the Indonesia Navy Posture.
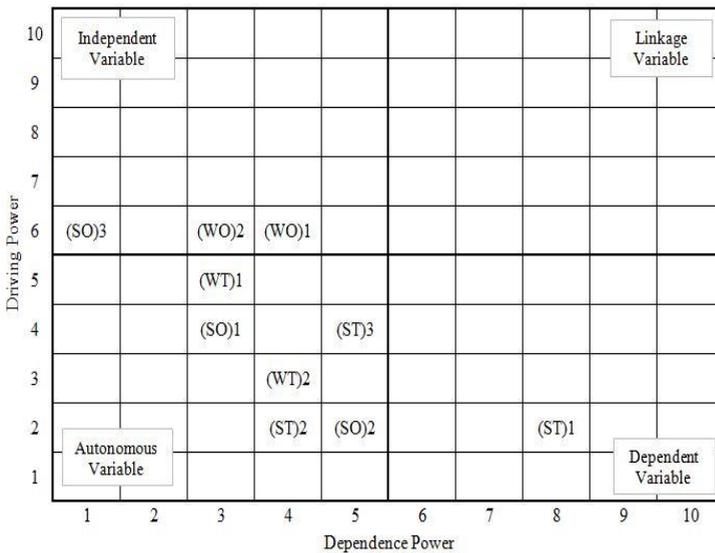
Sector **I**: Autonomous Driver
Sector **II**: Dependent Driver
Sector **III**: Linkage Driver
Sector **IV**: Independent Driver

Figure3 Driving Power and Dependence Diagram
Source: Data Analytic from Author

From the driver and dependency diagram shown in Figure 4, it is explained that no driver has a strong linkage (sector III). Furthermore, in sector I there are six drivers, namely (WO)1; (SO)1; (ST)3; (WT)2; (ST)2; (SO)2. (ST) 1 is in sector II. In sector IV there are 3 drivers (SO) 3; (WO) 2; (WO) 1.

According to the results of data analysis with the ISM method, it shows that the strategy (ST)1 is a key element in the strategy of developing the posture of the Navy. This is highly relevant to threats to existing maritime security. The key strategy is an increase of state budget percentage for the maritime sector in the development of Navy ability.

Conclusion

Based on SWOT analysis, there are several internal factors that become strengths and weaknesses as contained in the table upon. It has eight points for strength analysis factor and seven points for weakness analysis factor. It has seven points for opportunity analysis factor and nine points for threat analysis factor. The total strategy that has been formulated is 10 (ten) sub strategies which determine the development of the Navy posture abilities.

Based on ISM Method, it is evident that (ST)1 is a significant driver for the development of the strategy. (SO)2 is at level II; (ST)3 and (WT)2 are at level III; (ST)2 is at level IV; (WO)1 and (WO)2 are at level V; (SO)1 is at level VI. (WT)1 and (SO)3 are at the top of the hierarchy models of structural modeling based on interpretation.

It shows that the strategy (ST)1 is a key element in the developing strategy of the Navy posture. This is highly relevant to threats to existing maritime security. On the other side, the Navy is a non-profit organization. The key strategy is an increase of state budget percentage for the maritime sector in the development of Navy ability.

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Information Technology as a Factor of Sustainable Development of Serbian Agriculture

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Abstract

Trend of population growth and the need for greater production of health-safe food, on the one hand, and environmental protection on the other hand, affect the change of production technologies in agriculture. Challenges of modern agriculture are reflected in the growth of productivity, but also the long-term sustainability of the agricultural sector. It is indisputable that information technology (IT) has a direct impact on the productivity of agriculture, and as the ultimate goal leads to the growth of the profit of agricultural producers. Precise agriculture, the application of state-of-the-art technical systems for satellite guidance and automatic management, as well as the use of Geographic Information Systems (GIS) lead to yield growth, but also affect the rational use of inputs, which leads to reduction of adverse effects on the environment. Accordingly, the implementation of new technologies in agriculture is an important factor in improving agricultural production, as well as the potential for sustainable development of this sector. The units of observation in this research are Serbia and all countries of the European Union. The aim of this research is to determine the position of Serbia in relation to the countries of the European Union in terms of the dimensions of sustainable development of agriculture, as well as to consider the current level of application of information technologies in the agriculture of these countries. The paper analyzes a set of indicators of economic, ecological and social sustainability and their connection with the implementation of information technologies in agriculture. The results of the research indicate that the current application of information technologies in Serbia's agriculture, compared to EU countries, is modest, primarily due to the unfavorable educational structure of agricultural producers, as well as limited financial resources, which significantly impedes the process of IT implementation.

Keywords

Information Technology, Agriculture, Serbia.

Introduction

The challenges of today's business dictate certain changes. In agriculture, globally, the trend of population growth, the impact of agriculture on the environment, the reduction of greenhouse gases, and the increase in productivity and the efficiency of agriculture, affect changes in production technologies. The ultimate goal of new technologies is reflected in the long-term sustainability of agriculture. In other words, in addition to the economic effects (profit growth, productivity, etc.), new technologies will be environmentally friendly and socially acceptable. Within this research, the focus is on Information Technology (IT) in agriculture. The term IT includes a number of technologies related to information processing and communication

assistance. According to Franklyn & Tukur (2012) there are several reasons for the successful adoption of IT in agriculture: an increased need for information; the widespread availability of computers and the Internet and the ease use of software packages; maintaining existing competencies; flexibility; timely information and management support. In addition, IT in agriculture also affects the competitiveness of agricultural producers through: finding new customers; the use of market information for optimum sales, but also the procurement of inputs; introduction of quality standards; better production management and data analysis for more efficient planning of future business processes (FACET, 2013). According to Ćelić, Drašković, Uzelac & Petrov (2018) the most influential trend, which has emerged as a result of the development of information and communication technologies, is business over the internet.

The challenge is to ensure that new technologies help farmers become more economically competitive, and that these technologies are environmentally sustainable. New trends impose increasing attention to the conservation of natural habitats, with the control of the consumption of natural resources. Such trends also occur in the context of agricultural production. Namely, sustainable agriculture is defined as a part of overall sustainable development at the United Nations Conference on Sustainable Environment and Development in 1992, in the Agenda 21 document (UNCED, 1992). Sustainability in agriculture is established as a link between the ecological production method and the agricultural production itself. The concept of sustainable agriculture was created in response to the increasing exploitation of agricultural resources due to conventional agricultural production, which led to certain ecological consequences (Tilman et al., 2001). This concept implies economic, environmental and social sustainability of a sector. The development of agriculture in the last decade had the greatest merit due to large research in the field of information technology, characterized by high productivity and an intensive method of production (Verdouw, Beulens, Trienekens, & Verwaart, 2010). As a result of research in the application of information technologies in the field of agricultural production, ERP systems, IT applications, Global Positioning System, Geographic Information System (GIS) and remote

detection have been developed. Agricultural producers, especially in developed countries, strive to implement new technologies, or to establish the concept of *precise agriculture* in order to achieve the sustainability of this sector. The concept of precise agriculture implies the optimal use of agricultural inputs, that is, pesticides, chemical fertilizers, water use and efficient use of irrigation systems, as well as waste management in agriculture (Legg & Viatte, 2001).

Big farms, which are market-oriented, legal entities and entrepreneurs, are investing heavily in new technologies, as it is necessary to respond in an appropriate manner to rapid changes in terms of market liberalization and the increase of foreign competition. The problem is small family farms, with traditional production technologies. In agriculture in Serbia, according to the Census of Agriculture (2012), these farms constitute the majority of the total structure. Also, inadequate educational structure is one of the important limiting factors in the application of new technologies in Serbia. The application of IT in Serbian agriculture is at a low level, compared to highly developed countries. As the strategic goal of Serbia is the EU accession, the aim of this research is set in two ways. First, it is necessary to determine the position of Serbia in relation to the EU countries in terms of the dimensions of sustainable development of agriculture. Second, it is necessary to consider all the benefits of using IT in agriculture to the sustainability of this sector.

1. Material and methods

The units of observation in this research are Serbia and all countries of the European Union. In order to determine the position of Serbia in relation to the EU countries, in terms of the sustainability of agriculture, a multivariate statistical analysis was used, or Cluster analysis. The database is complemented by available data sources: FAOstat and EUROSTAT. The observation period is from 2009 to 2015. The selected sustainability indicators are:

- Average economic farm size (standard output per farm) as one of the key economic indicators of agriculture in one country;
- Use of inputs: fertilizers, pesticides and diesel fuels - factors that determine the degree of intensification of agricultural

production (economic, but also environmental impact);

- The resource structure of agriculture - the ratio of agricultural land per active farmer, whereby the resource structure determines the choice of production technology (mechanical and bio-chemical) and the level of partial productivity;
- Share of managers in agricultural holdings without formal education (%) - sociological factor in the application of new technologies;
- Share of organic production area in total agricultural land (%);
- Share of agriculture in the total greenhouse gas emissions (%).

The choice of sustainability indicators depends primarily on the available data. The problem is precisely in incomplete databases, especially for agriculture in Serbia. Cluster analysis involves grouping observation units into classes, in such a way that similar units are found in the same cluster (Kaufman & Rousseeuw, 2009). The paper uses a hierarchical method, the result of which is

the Dendrogram, which represents a graphic representation of the cluster in the form of a connecting tree. An important segment of the cluster analysis is the selection of methods for calculating the distance between clusters. In this paper, *complete linkage* was used, that is, the maximum distance of objects. This method was applied in order to determine the position of Serbia in relation to EU countries.

2. Results

Sustainability of agriculture is the adaptation of conventional production, i.e. the use of more efficient technologies, which will reduce or eliminate undesirable effects, primarily on the environment. Hence, without the proper application of all the determinants, the concept of sustainable agriculture remains only a targeted condition that should be achieved. It is also difficult to define this concept precisely, since it implies economic, sociological and ecological sustainability of agriculture. The cluster analysis shows the separation of highly developed EU countries: Germany, France, the Netherlands,
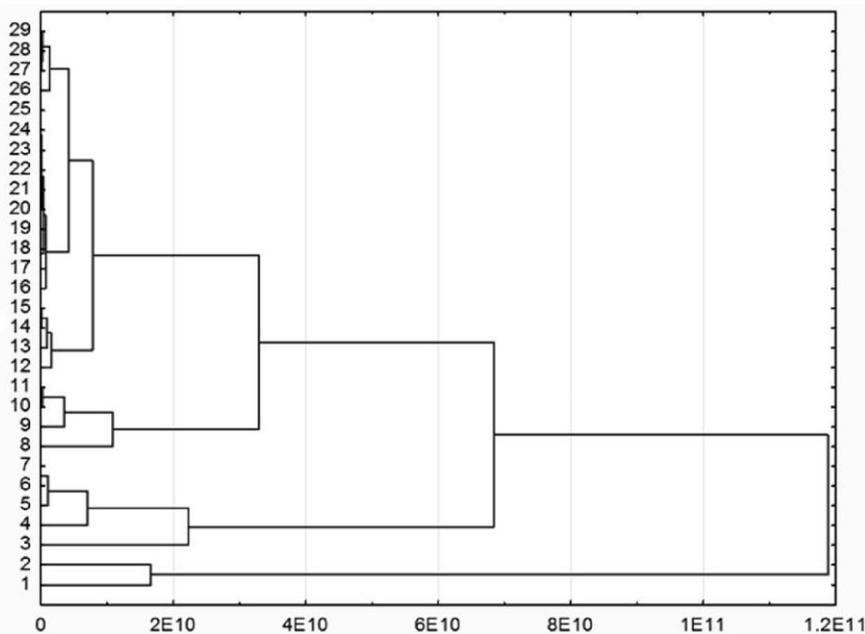
1- Germany	6- Czech Republic	11- Italy	16- Estonia	21- Croatia	26- Slovakia
2- France	7- Belgium	12- Romania	17- Malta	22- Portugal	27- Sweden
3- Netherlands	8- UK	13- Ireland	18- Latvia	23- Lithuania	28- Finland
4- Luxembourg	9- Poland	14- Hungary	19- Republic of Cyprus	24- Serbia	29- Austria
5- Denmark	10- Spain	15- Greece	20- Slovenia	25- Bulgaria	

Figure 1: Cluster analysis
Source: Authors' calculation based on selected indicators

Luxembourg, Denmark, the Czech Republic and Belgium. Farms in these countries are primarily economically viable given that the average economic size of the holding (measured by total farm income) in these countries is the highest. On the other hand, Serbia is most similar to Bulgaria and Lithuania. In other words, it is notable that the grouping of the socialist countries and the Mediterranean countries (Portugal, Spain, Greece and Italy) is clustered (Figure 1). From the aspect of the average economic size of the holding, in the observed period, Romania, Bulgaria, Serbia and Lithuania have the lowest values. Also, the difference between these countries is reflected in the educational structure of managers of agricultural holdings. The educational structure is an essential basis for the adoption and application of new technologies. Considering the share of managers without formal education, the unfavorable educational structure is a feature of Romania, Bulgaria, Greece and Serbia.

Ecological sustainability of agriculture is reflected in more efficient resource management, that is, through more efficient use of, primarily, chemical inputs. The degree of intensification in this research was observed through the use of pesticides, fertilizers and diesel fuels. It is noticeable that highly developed countries have a higher degree of intensification of agricultural production, which has a negative effect on the environment. However, these countries are the initiators of the implementation of new technologies, in order to maintain an adequate level of productivity to ensure the economic efficiency of the producers, but also to reduce the harmful effects on the environment.

As environmental indicators of agriculture, two variables have been selected: the share of organic production in total agricultural land (%) and the share of agriculture in total emission with greenhouse effect (%). As a specific group of countries, Austria, Sweden and Finland stand out. Namely, the agriculture of Sweden and Finland is characterized by a lower degree of intensification of agriculture. From all the analyzed countries, Austria stands out as the country with the largest share of organic production in total agricultural land (around 16%). Organic agriculture is often classified as an adequate model of sustainable agriculture (OECD, 2003) in research. Serbia has a small share of organic production, given the good resource conditions, which makes it the last country in the countries analyzed in the research, with 0.3% of the land that makes organic

production. It is indisputable that this production, which does not use chemical inputs, provides multiple benefits to the society as a whole. Organic farming contributes to socio-economic and environmentally sustainable development, especially in underdeveloped countries, owing to the application of organic principles, implying efficient local resource management, and thus cost efficiency (Birovljev & Ćetković, 2014). In other words, organic production can contribute to increase of revenues and improving the quality of life. Agricultural production affects the emission of CO_2, methane, nitrogen-sub oxide, which cause a greenhouse effect. Therefore, the European Union has defined measures and directives that affect the reduction of greenhouse gas emissions from the agricultural sector.

3. The influence of information technology on agricultural sustainability

All innovations are created with the idea of helping the development of the current. Hence, innovations in the field of information technologies, which are implemented in the context of agricultural production, influence the growth of the quality of the production process, but also the output itself, with lower costs per unit of production, while the effects produced in this way should not affect the disturbance ecosystem. With the application of precision agriculture methods, where the task was to find the best solution for more efficient production, there was considerable savings. Savings are generated in the higher yield of primary culture, reducing the costs of protecting plants and fertilizers. As the basic method of precision agriculture, in this case, satellite positioning and automatic control was used (Zhang, Wang, & Wang, 2002). From an economic point of view, the producer is always striving to achieve high productivity, high yields and profits. The social character of sustainability by the implementation of information technologies primarily refers to the improvement of the social status of the population in rural areas, as well as through the production of health-safe food, the quality of which meets all standards. Ecological effects of sustainability should affect the reduction of adverse effects on the ecosystem resulting from agricultural production, which ultimately ensures a cleaner environment, thus fully responding to the concept of sustainable agriculture.

In the series of significant breakthroughs in information technology in agriculture in the last few decades, in particular, GPS technology, or satellite guidance of agricultural machines, is distinguished. It is, undoubtedly, the most advanced technology that is rapidly developing and improving (Luecke & Katz, 2003). The precursor of precision agriculture is based on a large number of information necessary for decision making. Indirect comparison of the long-term parameters obtained from the plot enables the optimum use of the means of operation, minimizing environmental risks, increasing the quality of products and above all the increase in the profitability of production or profits. This way of agricultural production enables production on the principles of sustainable agriculture. Another innovation in the field of IT in agriculture would be applications (e-mail, weather reports, market prices, etc.) (Gorla, 2009). Digital geographic data that can be stored, analyzed and displayed in a number of different representations are the core of precise agriculture. Systems for handling these data are called GIS. Agriculture is an excellent area for the application of GIS because it represents a natural resource, requires movement, distribution of large quantities of products, goods and services. GIS enables the creation of various forms of reports - from thematic maps and 3D terrain models through multimedia displays to classic tabular reports. Depending on the specific needs, it is possible to create the following thematic maps for a region: the boundaries and division of the general plan area, planned land use, planned water supply systems, planned system of channelling atmospheric and wastewater, planned watercourse management (Čekerevac, Anđelić, Glumac & Dragović, 2010).

Milovanović (2014) in his research points to the difference in the application of information technologies in the EU countries. Namely, in countries such as Bulgaria and Romania, there is a lower level of use of new technologies compared to highly developed EU countries. The analyzed technologies are:

- Use of computers;
- Internet;
- Use of mobile phones;
- Farm Informational System;
- Livestock registration;
- Geo-fertilizing.

Namely, as agriculture is characterized by predominantly small, traditional farms, unfavorable educational as well as age structure, it has the problem of implementing IT technologies. Potential difficulties when the implementation of these methods in agricultural production of Serbia is possible are also evident in the face of poor financial situation of the population, which mostly deals with the traditional type of production, or the inability to invest in the modernization of agricultural production. Observing only the use of the two most basic IT: computers and the Internet, according to the Census of Agriculture (2012) in Serbia, less than 2% of the total number of households use a computer. Also, according to the World Bank (2018), the availability of the Internet in Serbia (next to Romania and Bulgaria) amounts to less than 50% of the total population. In highly developed countries, such as the Netherlands, Denmark, Sweden, Luxembourg, more than 90% of the total population has access to the Internet.

Conclusion

The long-term sustainable development of agriculture implies sustained economic growth, technological advancement, efficient resource management and increasing quality of life in the final instance. Observing the position of Serbia in relation to EU countries, Serbia's agriculture is lagging behind in other countries. In practice, sustainability of agriculture is achieved through the coordination of the activities of agrarian and environmental policy. The importance of sustainability within the European Union has already been highlighted, defining laws and directives aimed at protecting the agro-environment and increasing the standard of living of farmers. On the other hand, compared to European Union countries, Serbia's agricultural performance is significantly lagging behind. The imperative of agricultural policy in Serbia in the future period is harmonization with the principles of the Common Agricultural Policy of the EU, as well as harmonization of the environmental protection policy with the EU rules. The chance for agriculture in Serbia is represented by IPA funds, that is, IPARD component of pre-accession assistance to candidate countries for EU membership, aimed at reducing developmental disparities. Modern agriculture becomes the area of information technology use. The development of agriculture and the provision of health-safe food are common concerns of the international community. The positive impact of IT on the sustainability of agriculture is indisputable. The future goals of Serbia's agriculture development

should include modernization and increasing the competitiveness of agricultural producers. Considering the technological lag of Serbia's agriculture, these goals cannot be achieved in the short term.

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Manuscript Requirements

A paper must be written in text processor Microsoft Word. Paper size: A4. Margins: 3.0 cm on top and bottom, and 2.5 cm on left and right sides. As a guide, articles should be no more than 5.000 words in length. In case the paper exceeds the normal length, the Editors' consent for its publication is needed. Articles submitted for publication in Journal should include the research aim and tasks, with detailed methodology, presenting literature overview on the research object, substantiation of the achieved results and findings, conclusions and a list of references. Manuscripts should be arranged in the following order of presentation.

First page: Title (no more that 10 words), subtitle (if any), autobiographical note (the author's full name, academic affiliation, telephone, fax and e-mail address and full international contact). Respective affiliations and addresses of co-authors should be clearly indicated. Please also include approximately 50 words of biographical information on each author of the submitted paper.

Second page:
- A self-contained abstract/summary/resume of up to 150 words, describing the research objective and its conclusions
- Up to ten keywords, which encapsulate the principal subjects covered by the article; and
- A self-contained summary of up to 200 words, describing the article and its conclusions.

Subsequent pages: Main body of the text with headings, footnotes, a list of references, appendices, tables and illustrations. The paragraph parameters are:
- Font: Times New Roman, 10 pt, regular
- Spacing: Before: 0, After: 0
- Line Spacing: Single
- Alignment: Justified
- Indentation: Left: 0, Right: 0, Special: 0.
- Style: Normal (**not Title, Heading1, Heading2,...,Body Text, etc!**)

Leave an empty line between paragraphs.

Headings: Headings must be short, clearly defined and numbered, except for Introduction and Conclusions. Apply at most three levels of headings. Please, leave two empty lines before headings and one empty line after. Font: Times New Roman, bold, 16 pt, centered.
Section headings should be in **bold** with Leading Capitals on Main Words, Times New Roman, 14pt, bold, centered.
Sub-section headings should be in *italics*, with Leading Capitals on Main Words, Times New Roman, 12 pt, bold.

All tables, graphs and diagrams are expected to back your research findings. They should be clearly referred to and numbered consecutively in Arabic numerals. They should be placed in the text at the appropriate paragraph (just after its reference).

Tables should be centered. All tables must have captions. The title of your table should follow the table number. Tables should not be wider than the margins of the paper. Skip two lines before and after each table.

Figures should be centered. All figures must have captions. The title of figures should appear immediately below the figure. The title of the figure should follow the figure number. Figures should not be wider than the margins of the paper. Skip two lines before and after each figure. Figures will not be redrawn by the publisher. Figures should be high-quality **grayscale** graphics (please, do not use colors): vector drawings (with text converted to curves) or 300 dpi bitmaps. Please do not supply any graphics copied from a website, as the resolution will be too low. In all figures taken or adapted from other sources, a brief note to that effect is obligatory, below the figure. One sentence at least referring to the illustration is obligatory.

Mathematical expressions should be numbered on the right side, while all variables and parameters must be defined.

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Proof

Authors are responsible for ensuring that all manuscripts (whether original or revised) are accurately typed before final submission. One set of proof will be sent to authors, if requested, before the final publication, which must be returned promptly.

Referencing Guide

The references should specify the source (such as book, journal article or a web page) in sufficient detail to enable the readers to identify and consult it. The references are placed at the end of the work, with sources listed alphabetically (a) by authors' surnames or (b) by the titles of the sources (if the author is unknown). Multiple entries by the same author(s) must be sequenced chronologically, starting from the earliest, e.g.:

> Ljubojević, T.K. (1998).
> Ljubojević, T.K. (2000a).
> Ljubojević, T.K. (2000b).
> Ljubojević, T.K., & Dimitrijević, N.N. (1994).

Here is a list of the most common reference types:

A. PERIODICALS

Authors must be listed by their last names, followed by initials. Publication year must be written in parentheses, followed by a full stop. Title of the article must be in sentences case: only the first word and proper nouns in the title are capitalized. The periodical title must be in title case, followed by the volume number, which is also italicized:

> Author, A. A., Author, B. B., & Author, C. C. (Year). Title of article. *Title of Periodical, volume number*(issue number), pages.

➲ Journal article, one author, paginated by issue
Journals paginated by issue begin with page 1 in every issue, so that the issue number is indicated in parentheses after the volume. The parentheses and issue numbers are not italicized, e.g.

> Tanasijević, V. (2007). A PHP project test-driven end to end. *Management Information Systems, 5* (1), 26-35.

➲ Journal article, one author, paginated by volume
Journals paginated by volume begin with page 1 in issue 1, and continue page numbering in issue 2 where issue 1 ended, e.g.

> Perić, O. (2006). Bridging the gap: Complex adaptive knowledge management. *Strategic Management, 14*, 654-668.

➲ Journal article, two authors, paginated by issue

Strakić, F., & Mirković, D. (2006). The role of the user in the software development life cycle. *Management Information Systems, 4* (2), 60-72.

➲ Journal article, two authors, paginated by volume

Ljubojević, K., & Dimitrijević, M. (2007). Choosing your CRM strategy. *Strategic Management, 15*, 333-349.

➲ Journal article, three to six authors, paginated by issue

Jovanov, N., Boškov, T., & Strakić, F. (2007). Data warehouse architecture. *Management Information Systems, 5* (2), 41-49.

➲ Journal article, three to six authors, paginated by volume

Boškov, T., Ljubojević, K., & Tanasijević, V. (2005). A new approach to CRM. *Strategic Management, 13*, 300-310.

➲ Journal article, more than six authors, paginated by issue

Ljubojević, K., Dimitrijević, M., Mirković, D., Tanasijević, V., Perić, O., Jovanov, N., et al. (2005). Putting the user at the center of software testing activity. *Management Information Systems, 3* (1), 99-106.

➲ Journal article, more than six authors, paginated by volume

Strakić, F., Mirković, D., Boškov, T., Ljubojević, K., Tanasijević, V., Dimitrijević, M., et al. (2003). Metadata in data warehouse. *Strategic Management, 11*, 122-132.

➲ Magazine article

Strakić, F. (2005, October 15). Remembering users with cookies. *IT Review, 130*, 20-21.

➲ Newsletter article with author

Dimitrijević, M. (2009, September). MySql server, writing library files. *Computing News, 57,* 10-12.

➲ Newsletter article without author

VBScript with active server pages. (2009, September). *Computing News,57,* 21-22.

B. BOOKS, BROCHURES, BOOK CHAPTERS, ENCYCLOPEDIA ENTRIES, AND BOOK REVIEWS

Basic format for books

Author, A. A. (Year of publication). *Title of work: Capital letter also for subtitle*. Location: Publisher.

Note: "Location" always refers to the town/city, but you should also include the state/country if the town/city could be mistaken for one in another country.

➲ Book, one author

Ljubojević, K. (2005). *Prototyping the interface design*. Subotica: Faculty of Economics.

➲ Book, one author, new edition

Dimitrijević, M. (2007). *Customer relationship management* (6th ed.). Subotica: Faculty of Economics.

➲ Book, two authors

Ljubojević, K., Dimitrijević, M. (2007). *The enterprise knowledge portal and its architecture*. Subotica: Faculty of Economics.

➲ Book, three to six authors

Ljubojević, K., Dimitrijević, M., Mirković, D., Tanasijević, V., & Perić, O. (2006). *Importance of software testing*. Subotica: Faculty of Economics.

➲ Book, more than six authors

Mirković, D., Tanasijević, V., Perić, O., Jovanov, N., Boškov, T., Strakić, F., et al. (2007). *Supply chain management*. Subotica: Faculty of Economics.

➲ Book, no author or editor

Web user interface (10th ed.). (2003). Subotica: Faculty of Economics.

➲ Group, corporate, or government author

Statistical office of the Republic of Serbia. (1978). *Statistical abstract of the Republic of Serbia*. Belgrade: Ministry of community and social services.

➲ Edited book

Dimitrijević, M., & Tanasijević, V. (Eds.). (2004). *Data warehouse architecture*. Subotica: Faculty of Economics.

➲ Chapter in an edited book

Boškov, T., & Strakić. F. (2008). Bridging the gap: Complex adaptive knowledge management. In T. Boškov & V. Tanasijević (Eds.), *The enterprise knowledge portal and its architecture* (pp. 55-89). Subotica: Faculty of Economics.

➲ Encyclopedia entry

Mirković, D. (2006). History and the world of mathematicians. In *The new mathematics encyclopedia* (Vol. 56, pp. 23-45). Subotica: Faculty of Economics.

C. UNPUBLISHED WORKS

➲ Paper presented at a meeting or a conference

Ljubojević, K., Tanasijević, V., Dimitrijević, M. (2003). *Designing a web form without tables*. Paper presented at the annual meeting of the Serbian computer alliance, Beograd.

➲ Paper or manuscript

Boškov, T., Strakić, F., Ljubojević, K., Dimitrijević, M., & Perić, O. (2007. May). *First steps in visual basic for applications*. Unpublished paper, Faculty of Economics Subotica, Subotica.

➲ Doctoral dissertation

Strakić, F. (2000). *Managing network services: Managing DNS servers.* Unpublished doctoral dissertation, Faculty of Economics Subotica, Subotica.

➲ Master's thesis

Dimitrijević, M. (2003). *Structural modeling: Class and object diagrams.* Unpublished master's thesis, Faculty of Economics Subotica, Subotica.

D. ELECTRONIC MEDIA

The same guidelines apply for online articles as for printed articles. All the information that the online host makes available must be listed, including an issue number in parentheses:

Author, A. A., & Author, B. B. (Publication date). Title of article. *Title of Online Periodical, volume number*(issue number if available). Retrieved from http://www.anyaddress.com/full/url/

➲ Article in an internet-only journal

Tanasijević, V. (2003, March). Putting the user at the center of software testing activity. *Strategic Management, 8* (4). Retrieved October 7, 2004, from www.ef.uns.ac.rs/sm2003

➲ Document from an organization

Faculty of Economics. (2008, March 5). *A new approach to CRM.* Retrieved July 25, 2008, from http://www.ef.uns.ac.rs/papers/acrm.html

➲ Article from an online periodical with DOI assigned

Jovanov, N., & Boškov, T. A PHP project test-driven end to end. *Management Information Systems*, 2 (2), 45-54. doi: 10.1108/06070565717821898.

➲ Article from an online periodical without DOI assigned

Online journal articles without a DOI require a URL.

Author, A. A., & Author, B. B. (Publication date). Title of article. *Title of Journal, volume number.* Retrieved from http://www.anyaddress.com/full/url/

Jovanov, N., & Boškov, T. A PHP project test-driven end to end. *Management Information Systems*, 2 (2), 45-54. Retrieved from http://www.ef.uns.ac.rs/mis/TestDriven.html.

REFERENCE QUOTATIONS IN THE TEXT

➲ Quotations

If a work is directly quoted from, then the author, year of publication and the page reference (preceded by "p.") must be included. The quotation is introduced with an introductory phrase including the author's last name followed by publication date in parentheses.

According to Mirković (2001), "The use of data warehouses may be limited, especially if they contain confidential data" (p. 201).

Mirković (2001), found that "the use of data warehouses may be limited" (p. 201). What unexpected impact does this have on the range of availability?

If the author is not named in the introductory phrase, the author's last name, publication year, and the page number in parentheses must be placed at the end of the quotation, e.g.

He stated, "The use of data warehouses may be limited," but he did not fully explain the possible impact (Mirković, 2001, p. 201).

⮩ **Summary or paraphrase**

According to Mirković (1991), limitations on the use of databases can be external and software-based, or temporary and even discretion-based. (p.201)

Limitations on the use of databases can be external and software-based, or temporary and even discretion-based (Mirković, 1991, p. 201).

⮩ **One author**

Boškov (2005) compared the access range…

In an early study of access range (Boškov, 2005), it was found…

⮩ When there are **two authors**, both names are always cited:

Another study (Mirković & Boškov, 2006) concluded that…

⮩ If there are **three to five authors**, all authors must be cited the first time. For subsequent references, the first author's name will cited, followed by "et al.".

(Jovanov, Boškov, Perić, Boškov, & Strakić, 2004).

In subsequent citations, only the first author's name is used, followed by "et al." in the introductory phrase or in parentheses:

According to Jovanov et al. (2004), further occurences of the phenomenon tend to receive a much wider media coverage.

Further occurences of the phenomenon tend to receive a much wider media coverage (Jovanov et al., 2004).

In "et al.", "et" is not followed by a full stop.

⮩ **Six or more authors**

The first author's last name followed by "et al." is used in the introductory phrase or in parentheses:

Yossarian et al. (2004) argued that…

… not relevant (Yossarian et al., 2001).

⮩ Unknown author

If the work does not have an author, the source is cited by its title in the introductory phrase, or the first 1-2 words are placed in the parentheses. Book and report titles must be italicized or underlined, while titles of articles and chapters are placed in quotation marks:

> A similar survey was conducted on a number of organizations employing database managers ("Limiting database access", 2005).

If work (such as a newspaper editorial) has no author, the first few words of the title are cited, followed by the year:

> ("The Objectives of Access Delegation," 2007)

Note: In the rare cases when the word "Anonymous" is used for the author, it is treated as the author's name (Anonymous, 2008). The name Anonymous must then be used as the author in the reference list.

⮩ Organization as an Author

If the author is an organization or a government agency, the organization must be mentioned in the introductory phrase or in the parenthetical citation the first time the source is cited:

> According to the Statistical Office of the Republic of Serbia (1978), …

Also, the full name of corporate authors must be listed in the first reference, with an abbreviation in brackets. The abbreviated name will then be used for subsequent references:

> The overview is limited to towns with 10,000 inhabitants and up (Statistical Office of the Republic of Serbia [SORS], 1978).

> The list does not include schools that were listed as closed down in the previous statistical overview (SORS, 1978).

⮩ When citing more than one reference from the same author:

> (Bezjak, 1999, 2002)

⮩ When several used works by the same author were published in the same year, they must be cited adding a, b, c, and so on, to the publication date:

> (Griffith, 2002a, 2002b, 2004)

⮩ Two or more works in the same parentheses

When two or more works are cited parenthetically, they must be cited in the same order as they appear in the reference list, separated by a semicolon.

> (Bezjak, 1999; Griffith, 2004)

⮩ Two or more works by the same author in the same year

If two or more sources used in the submission were published by the same author in the same year, the entries in the reference list must be ordered using lower-case letters (a, b, c…) with the year. Lower-case letters will also be used with the year in the in-text citation as well:

> Survey results published in Theissen (2004a) show that…

➲ To **credit an author for discovering a work**, when you have not read the original:

> Bergson's research (as cited in Mirković & Boškov, 2006)…

Here, Mirković & Boškov (2006) will appear in the reference list, while Bergson will not.

➲ When **citing more than one author**, the authors must be listed alphabetically:

> (Britten, 2001; Sturlasson, 2002; Wasserwandt, 1997)

➲ When there is **no publication date**:

> (Hessenberg, n.d.)

➲ **Page numbers must always be given for quotations**:

> (Mirković & Boškov, 2006, p.12)

> Mirković & Boškov (2006, p. 12) propose the approach by which "the initial viewpoint…

➲ **Referring to a specific part of a work**:

> (Theissen, 2004a, chap. 3)

> (Keaton, 1997, pp. 85-94)

➲ **Personal communications, including interviews, letters, memos, e-mails, and telephone conversations**, are cited as below. (These are *not* included in the reference list.)

> (K. Ljubojević, personal communication, May 5, 2008).

FOOTNOTES AND ENDNOTES

A few footnotes may be necessary when elaborating on an issue raised in the text, adding something that is in indirect connection, or providing supplementary technical information. Footnotes and endnotes are numbered with superscript Arabic numerals at the end of the sentence, like this.[1] Endnotes begin on a separate page, after the end of the text. However, Strategic Management journal **does not recommend the use of footnotes or endnotes.**

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