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## Social Capital in Smart Development

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### Kapitał społeczny w rozwoju inteligentnym

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**Abstract:** Smart development, primarily based on smart city technologies, also requires the existence of smart communities. Smart communities are influenced by social developments in the community, which are dynamic and determined by individuals' social levels. Therefore, this study aimed to analyse the use of social capital in building a smart society. The author draws attention to the significance of social capital in terms of social innovations and participation in the sustainable development of the smart city. The article uses the qualitative method analysis i.e. a literature review, and discusses (often critically) the relevance of particular forms, types and functions of social capital to smart development. The author explored how the use of social capital in the community encourages community empowerment and innovative activities and accelerates the development of a smart community. The results confirm that trust, appropriate norms and cooperation among residents affect smart development. Accordingly, social capital is essential in developing smart communities and smart cities. The paper's original contribution opens the prospects for further research on social capital.

**Keywords:** social capital, social innovations, smart development, smart city.

**Streszczenie:** Rozwój inteligentny, oparty przede wszystkim na technologiach *smart city*, wymaga również istnienia inteligentnych społeczności. Na inteligentne społeczności wpływają zmiany społeczne-

ne, które są dynamiczne i determinowane przez poziom społeczny jednostek. Celem artykułu jest charakterystyka wykorzystania kapitału społecznego w budowaniu inteligentnego społeczeństwa, ze szczególnym uwzględnieniem innowacji społecznych i partycypacji społecznej w rozwoju zrównoważonym *smart city*. Artykuł stanowi teoretyczny esej przeglądowy, spełniający funkcje idiograficzną i eksplanacyjną oraz ukazujący (często krytycznie) znaczenie poszczególnych form, rodzajów i funkcji kapitału społecznego dla inteligentnego rozwoju. Przeprowadzone studia literaturowe oraz badania własne miały dać odpowiedź, w jaki sposób prawidłowe wykorzystanie kapitału społecznego zachęca do wzmocnienia więzi społecznych i działań innowacyjnych, a w konsekwencji przyspiesza rozwój inteligentnej społeczności. Wyniki badań potwierdziły, że zaufanie, odpowiednie normy i kooperacja pomiędzy mieszkańcami wpływają na inteligentny rozwój. Artykuł może stanowić asumpt do dalszych, pogłębionych badań nad kapitałem społecznym.

**Słowa kluczowe:** kapitał społeczny, innowacje społeczne, rozwój inteligentny, *smart city*.

## 1. Introduction

Recent studies show that the role of social capital in the development of the modern economy is changing, and the assessment of these changes varies. The operationalisation of social capital is also differentiated, regarding the following: roles, relations and social networks (e.g. network accuracy); trust, values and social norms (e.g. reciprocity norm); the membership in organisations (e.g. Putnam's instrument). Economic (also smart) growth is related to communities determined by solid ties among stakeholders. The involvement of local or regional actors in activities aimed at creating a future vision and building smart strategies strengthens the absorptive potential of the network. Members of firmly integrated networks show a greater willingness to exchange opinions and attitudes on the city's future in terms of significant social capital resources linked with the city.

However, it is worth mentioning that in societies characterised by lasting ties and high quality of the traditionally approached social capital, people belonging to such a community have a privileged position and enhance 'stability' (but they can simultaneously exclude 'outsiders'). In contrast, the poorly networked locations are more willing to host outsiders and thus favour new combinations of ideas and resources. Therefore, there is a need for a smart and responsible city management policy that effectively reduces inadequate social capital, which excludes certain social groups, and essentially strengthens good social capital, improving the urban community's cohesion in every dimension. Undoubtedly, social capital represents a crucial element of the circumstances influencing successful collective actions undertaken in a city.

Additionally, today's society is in an unprecedented situation – more than half of the world's population lives in cities. Rapid urbanisation processes strengthen the need for sustainable city development and better quality of life for urban communities worldwide. Modern cities are also struggling with the difficulties associated with population decline, loss of the economic base, congestion, dynamic emigration,

environmental pollution, and structural social problems. Both the prosperity and the recession of cities bring serious challenges that require special attention and innovative policy responses from national and local authorities. The problems faced by cities in developed and developing countries are complex and challenging to solve due to the unique structures of cities, comprised of various interest groups with a high level of interrelationships, competing values, and social and economic complexity (Sinkiene et al., 2014, p. 933). Therefore, there is a high demand for strategic and sustainable solutions to these problems. One of the increasingly popular solutions in such a situation is the concept of smart growth, representing a new model that explains the development and operation of smart communities. Smart growth reflects a new paradigm, which focuses on efficiency, accessibility and comprehensive analysis. The urban paradigm supports smart development which is more compact and mixed.

## **2. The forms, types, functions and measurements of social capital**

The concept of social capital was already included in research discussions in the 1960s. Then, the aforementioned term, as well as many attributes of this capital, were clarified. One of the first, was Homans, who drew attention to the issue of norms supporting building trust between people (Homans, 1961, p. 386; Partycki, 2000, p. 486), which was used in later attempts to define social capital. Loury (1977) initiated advanced studies analysing this particular term at the beginning of the 1970s, followed by Coleman (1994a), who was inspired by the idea of social capital research and defined social capital through its function. He stated that it consists of chosen aspects of social structure and reinforces certain activities performed by individuals functioning in these structures. Social capital is characterised by productivity because it enables the achievement of specific goals that are otherwise unattainable (Coleman, 1994b, p. 302). According to the latter, “social capital should be perceived as any aspect of an informal social organisation, which constructs productive resources for either one or a larger number of entities” (Coleman, 1994a, p. 170). The study suggested that informal organisations are drivers for social capital establishment.

Another important scholar who dealt with the issue of social capital was Putnam, who described the relation between social capital and the efficiency of political institutions (1995, p. 258), and pointed out that social capital constitutes values, norms, roles, standards and relations that can improve social capacity by facilitating coordinated activities. Multidimensional networks have a beneficial influence on the economy, while robust and sustained community relations can bring economic profits since it is much easier to build trust between individuals ‘deeply rooted’ in a given community, which can significantly affect the costs of mutual transactions.

It is worth noting that social capital is assigned to specific locations (communes, municipalities, districts, regions, states) and cannot be easily moved or installed. This feature applies both to bonding-exclusive and bridging-inclusive capital (Putnam, 2007). Putnam, verifying the concept of social capital using the example of southern and northern Italian regions, stated that the quality of governance and the modernisation efficiency of the authorities positively correlate with the presence or absence of social capital. Northern regional governments based on a culture of trust, cooperation and reciprocity have achieved economic success, whereas southern regions, where feudal relations, authoritarianism and foreign government bureaucracy dominated for centuries, have not built an optimal competitive advantage. While these findings on the significance of social capital in Italy appear correct, Putnam's research dedicated to American regions does not fully explain the fast development of those territorial units. The study indicated the declining level of social trust and the decreasing number of NGOs, which do not correlate positively with the dynamic development of regions in the USA. This is because in some communities, the fundamental components of social capital, i.e. trust and honesty, can be replaced by formal and informal institutions (legal system, internal rules of conduct of professional associations, the desire to maintain a good reputation). However, as noted by Clark, this replacement is expensive and only prosperous economies can afford it (e.g. the USA). Following the assumptions of the New Political Culture, he pointed out that informal movements and bottom-up initiatives are necessary for the proper organisation of social life in mature communities (Swianiewicz, 2005, p. 16).

In addition, an in-depth analysis of the model of social capital was also conducted by Jordan, who considered social capital as a negative factor, weakening development and sometimes even posing a barrier. According to his concept based on the studies by Olson (1965) and Buchanan (1965, pp. 1-14), the market economy does enhance its interests maximisation through various "redistribution coalitions" at the expense of disorganised entities. It confuses the market allocation process of goods and serves their interception to divide them between the 'coalition' members on preferential terms (Frieske, 1999, p. 23; Jordan, 1996). Those who are not such privileged members are much more likely to fail.

The undesirable nature of social capital is a consequence of many factors. One of them is that not all teams work for the common good. Some maximise the implementation of their interests at the outsiders's expense (Kiersztyn, 2005, p. 49 cf. Portes, 1998). Examples of such practice are the operation of criminal groups, mafia and clans. Nonetheless, Matysiak also distinguished mixed social capital, since negative social capital "is not an independent item" and "its existence is derived, to an extent, from positive social capital" (Matysiak, 2005, p. 217).

This reasoning does not diminish the role of social capital in the economy. On the contrary, it allows to see that there are various forms of accumulation and use of social capital – more or less favourable from the point of view of social well-being. The above statement is also confirmed by Fukuyama, who agreed that

one of the irregularities occurring in economic operations is the growing distrust towards individual entities. He assumed that the other members in a group are entirely trustworthy and act in cooperation, following mutually recognised norms which encourage generally accepted behaviour. According to Fukuyama, this trust is historically and culturally subject to social capital and positively impacts on economic growth and social welfare (Fukuyama, 1997, p. 38). Using the example of Chinese society, Fukuyama indicated that a high level of trust and social solidarity in the group may affect their financial results, and not individuals outside the group.

To summarise, social capital is conducive to establishing stronger relations in the social network and new contacts outside it. Poor internal networking in a social group is not always considered a negative phenomenon. Granovetter described the advantages resulting from weak social ties, facilitating a higher mobility of the population (in line with the English proverb: “travel broadens the mind”). Overly solid social ties may reject new social trends or innovative ideas (the isolation effect), thus bringing about stagnation or socio-economic regression, as proved by the last decade of the 20th century. At that time, social capital presented certain erosion tendencies resulting from the development of civilisation and the strengthening of individualistic attitudes. The following potential problems related to local social capital can be listed (Theiss, 2004, p. 3):

- crucial imbalance among individuals/groups in access to social capital (the problem of social exclusion);
- social capital concentration in a family and small groups (the problem of abnormal familism);
- social capital accumulation in exclusion or criminal groups (the problem of a clique and ‘power-holding groups’).

The features of social capital mentioned above, the ambiguity of the assessment of its impact on development, difficulties in quantifying this impact, and the occurrence of new cultural and migration trends provided an impulse to search for new explanations of socio-economic relations.

## **2.1. Social innovations leading to new social capital**

Economic, social and environmental problems are growing in scale and complexity. Moreover, current concepts, models and approaches are not producing the required outcomes, even when large amounts of effort, money and time have been applied. Thus, the world needs drivers that will change the way communities and companies innovate, mainly when dealing with a new nature of innovation that differs from the industrial era’s innovations (Study on Social Innovation, p. 5). The financial, energetic and climatic crises make innovation even more essential to foster sustainability, stimulate creativity and boost smartness. The nature of innovation is changing as economies shift from the industrial age to the knowledge age. No longer is innovation exclusively associated with commercially exploitable technological products; social innovation is emerging as a critical part of the innovation ecosystem.

For the OECD, social innovation implies concept, process, product, organisation and financing changes. It can deal with new stakeholder and territorial relations. "Social innovation seeks new answers to social problems by: identifying and delivering new services that improve the quality of life of individuals and communities; identifying and implementing new labour market integration processes, new competencies, new jobs, and new forms of participation, as diverse elements that each contribute to improving the position of individuals in the workforce. Social innovations can therefore be seen as dealing with the welfare of individuals and communities as consumers and producers. The elements of this welfare are linked with their quality of life and activity. Wherever social innovations appear, they always bring about new references or processes. Social innovation is distinct from economic innovation because it is not about introducing new types of production or exploiting new markets in themselves but is about satisfying new needs not provided for by the market (even if markets intervene later) or creating new, more satisfactory ways of insertion in terms of giving people a place and a role in production. The key distinction is that social innovation deals with improving the welfare of individuals and communities through employment, consumption and/or participation, its expressed purpose being to provide solutions for individual and community problems" (OECD LEED Forum on Social Innovations).

There is a correlation between social innovations and social capital, as shown by research, however the nature and dynamics of this interaction differ. Some studies on social capital and innovation indicate that more social capital inhibits innovation. This is because, according to some scholars (Florida et al., 2002, p. 20), the barrier to innovation is not universality but difference. Others consider innovativeness as a contribution to economic growth by social capital (Akçomak & Weel, 2009, pp. 544-567). Such a line of thinking has a point of reference in political science analysis, e.g. in Putnam's empirical research (1992), emphasising the role of social capital in the economic success of Italian regions.

Undoubtedly, social innovations are significant for the quality of social capital. However, due to eco-innovations, progress should mean a simultaneous increase in economic, social and ecological effectiveness. Planning, technological, organisational and social solutions focused on this can be launched in any territorial unit, entity or venture. Nevertheless, especially those projects which, by their nature, range or scale, have a decisive impact on the environment, should be of interest to socially innovative thought. This applies to such fields as education, municipal economy, local government policy and the entire sphere of public utility and public management.

It is worth noting that social innovations are often experimental activities aimed at improving the quality of life of individuals, communities or enterprises (Phills et al., 2008). Their experimental nature results from implementing unique and one-off solutions on a large (or less, i.e. local) scale, the final effect of which is often difficult to predict. Diverse sources of development of social innovations affect the ambiguity

of these innovations. Paradoxes (inversions), hybrids of existing elements or bridges connecting different sectors and branches can be drivers of social innovations. Importantly, social innovation is beneficial in reducing ‘wicked problems’, which are social or cultural problems that are difficult or impossible to solve for reasons such as incomplete or contradictory knowledge, the number of people and opinions involved, the enormous economic burden, and the interconnected nature of these problems with other problems. There is no simple way of solving any wicked problem, but it does not mean that one should not do whatever can be done to solve them. There is a need to work together on research, and understand how the components of a system influence each other as well as other systems. Money and technology are hugely valuable resources: they are undoubtedly necessary but not sufficient. The essential element of solving these problems is educating others about them, raising awareness among citizens and showing the effects of their choices. It is impossible to deal with such problems alone as the issue requires interdisciplinary research and work with industry, local communities, decision-makers and legislators.

Finally, through the effective implementation of social innovations, the functioning of particular fields of socio-economic activities is improved, a better quality of life is accomplished, and good social capital is strengthened. Nonetheless, there is no one-size-fits-all approach to analysing social capital as a stimulant for innovation because it is up to the type of social capital – good or bad.

### **3. Smart development**

The concept of smart development takes into account the complex dynamic nature of the system and is based on promoting productive self-organisation rather than imposing the top-bottom linear solutions (Jucevičius & Grumadaitė, 2014, pp. 125-129).

Smart development must support and contribute to smart growth’s regional or local vision. Some critical elements related to smart development that would achieve this vision include higher densities, a wide range of choice in building types, a closer mix of employment and residential uses, and a more significant share of development in already-urbanised lands and key suburban nodes. The precise links between these aspects of regional structure/urban form and the attainment of smart growth objectives should be carefully considered (Cervero, 1998; Newman & Kenworthy, 1999; Smart Growth America, 2022).

Smart development as a concept may be defined as an approach that focuses on improving people’s quality of life, based primarily on three dimensions; environment, economy, and equity. The aim is to protect, conserve and enhance the environment they live in with accessibility to diverse economic opportunities for everyone. Furthermore, with the recent introduction of ICT in the approach, the notion is to make the city and the people smart (Randhawa & Kumar, 2007, pp. 701-710).

Summing up, smart development can be defined as smart growth combined with structural transformations primarily based on technological change. The concept of smart growth was used mainly in the 1990s within the framework of New Urbanism as a community-driven reaction to worsening trends in traffic congestion, school overcrowding, air pollution, loss of open space, effacement of valued historic places, and skyrocketing public facility costs. These goals are still among the reasons smart cities are attractive (Albino et al., 2015, pp. 3-21; Ballas, 2013, pp. 39-50; Berardi, 2013, pp. 72-78; Eger, 2009, pp. 47-53). The federal government's environmental arm, the U.S. Environmental Protection Agency (EPA), defined smart growth as "development that serves the economy, the community, and the environment. It changes the terms of the development debate away from the traditional growth/no growth question to how and where should new development be accommodated" (Ye et al., 2005, pp. 300-315). That is why the smart growth movement became popular and widely recognised after it was adopted by several global technology corporations, including IBM, Cisco and Siemens. The focus of the smart city discourse promoted by these companies rests on the role of ICT in efficiently managing urban infrastructure and services (Trends in Smart City Development, 2016). It has since evolved to mean almost any form of technology-driven innovation in urban management and the operation of cities (Bollier, 1998; Harrison & Donnelly, 2011; Praharaj & Han, 2019).

Additionally, the essential question is what a smart city means. The answer is that there is no universally accepted definition of a smart city, and that it means different things to different people. Therefore, the conceptualisation of a smart city varies from city to city and country to country, depending on the level of development, willingness to change and reform, resources and aspirations of the city residents. A smart city would have different connotations in Europe than in the USA or Asia, yet even in Europe, there is no one way of defining it.

Nevertheless, one can agree that a smart city is a high-tech and inclusively advanced. The city connects residents, information and infrastructural elements using new technologies. This creates a more sustainable, greener and a 'better-liveable' city.

A more comprehensive definition describes a smart city using different clusters that can be divided into three dimensions: technology (hardware and software infrastructures), people (creativity, diversity and education) and institutions (governance and policy). The technology dimension can be considered in six different definitions: the digital city, the intelligent city, the ubiquitous city, the wired city, the hybrid city and the information city. The human dimension is described in four clusters: the creative city, the learning city, the humane city and the knowledge city (Kramers et al., 2014, pp. 52-62; Nam & Pardo, 2011). Caragliu, Giffinger and other co-authors (2007), found social capital significance in functioning smart cities. In this case, cities are identified as smart when "investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure

fuel sustainable economic growth and high quality of life, with a wise management of natural resources, through participatory governance” (Allwinkle & Cruickshank, 2011, pp. 1-16; Caragliu & Del Bo, 2020; Del Bo & Nijkamp, 2011).

Over time, several definitions of the smart city concept have emerged, each distinguishing in terms of the leading smart characteristic deemed the most relevant to define the notion of urban smartness. Nonetheless, every definition more or less revolved around social capital as the pillar around which a city should build its smart pathway. However, the differentiating elements are the type or form of social capital, which, supported by a responsible urban policy, should constitute a natural stimulus for smart development.

#### **4. The importance of social capital in a smart city**

As already presented, the concept of social capital is defined in various ways, and its forms and types differ. However, the common feature of this concept is the collective character of social capital because it stems from a community of interpersonal relations, not merely the sum of all individuals within the community. In principle, social capital refers to a given community as a group of people with attitudes and behaviours. The community is one of the categories used for clarifying the smart city concept. This perspective builds on the previous bottom-up knowledge scheme and aims to inspire a sense of community among citizens. The significance of this factor mimics the concept of smart communities where members and institutions work together to transform their locality. A smart community needs to feel the desire to participate in and promote (smart) growth, which means that the community should present highly qualified social capital. It should be noted that one of the tangible benefits of social capital is involvement in network-based resources. These resources refer to information channels through which new ideas are proposed, spread, and finally implemented in a community. In turn, the attractiveness of these information channels is significantly increased thanks to the use of high technologies, which are one of the essential components of each smart city model.

Social capital is crucial for people who feel powerless. It allows people to be empowered through collaboration, organising and working together. Consequently, it can be an effective tool against even the most oppressive forces that seem insurmountable. The Civil Rights movements in the US, women’s suffrage, the Arab Spring and the dismantling of the Berlin Wall are examples of how social capital overcame seemingly immense and unbreakable systems (Smart Cities Drive). One can use good social capital to solve advanced urban problems appearing in modern cities just like in smart cities. The example of London shows how digital transformation enables the implementation of best practices combining top-down and bottom-up approaches in smart cities (Foth et al., 2016, pp. 203-221). In this case, the role of smart citizens in creating civic innovations using new technologies

is significant and can be a benchmark for other communities. Nakano & Washizu's (2021) analytical results empirically demonstrate the scheme conceptually described by Foth et al.

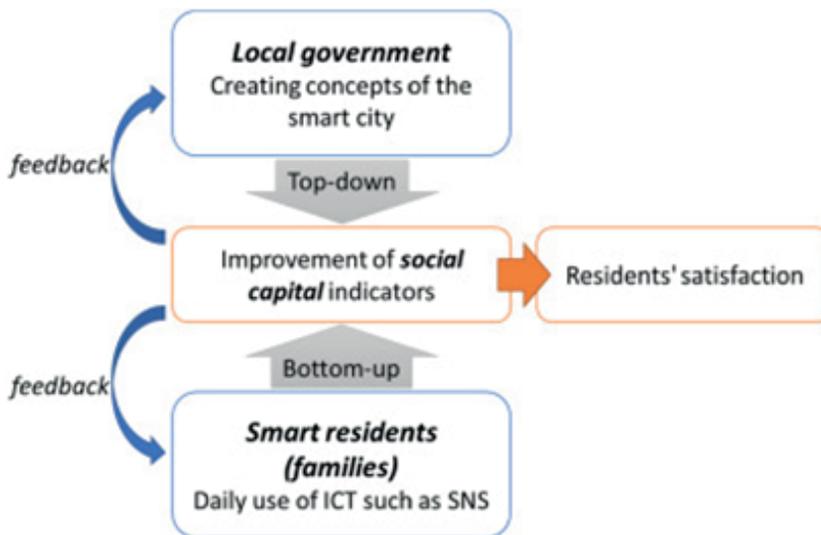


Fig. 1. Top-down and bottom-up approaches in smart city

Source: (Nakano & Washizu, 2021, p. 213).

According to Nakano & Washizu (2021), top-down and bottom-up approaches should parallel smart city management procedures. For both approaches, common social capital indicators should be used.

Another argument favouring the importance of social capital (trust, network, community, cooperation, participation) in a smart city may explain the differences between smart and conventional economic development. What distinguishes one concept from another is the emphasis on building on these community assets, rather than on pursuing jobs or tax base growth without particular regard for location or synergies among existing assets. Empowerment and increased social capital underpin community development. The formation of community prosocial behaviour is supported by social capital. This capital will accelerate if it interacts with social structures. Through these interactions, smart and sustainable resource management will be shaped by participatory governance – then the use of technology and the internet by exercising control, optimisation and development can turn cities into smart cities (Heradiansyah & Januari, 2021, pp. 3-4). The smartness implies a vision of an intelligent and socially inclusive community through IoT, Big Data and ICT. The ICT sector, characterised by globalisation, and IoT analytics and Big Data, can make smart cities even more efficient and resilient. Nonetheless, technological

advances should translate into better public services and reduce their environmental impact.

A smart city that wants to benefit from Industry 4.0 must remember that cooperation and partnership are essential. Such a city will be able to reconfigure the city structure, and the wealth of data and networks will make it easier for city authorities to acquire ‘technologically cleaner’ industries. By taking advantage of the achievements of the fourth industrial revolution, the driving force behind smart development is the high-tech and creative industries. They require a concentration of qualified and creative employees as well as intelligent residents who are able and, above all, want to use the achievements of technology and enhance social capital by active participation in public life and involvement in mature and intensive relations among urban stakeholders.

## 5. Conclusion

This research concludes that the efficient usage of social capital can make development smarter. High-quality social capital increases confidence and cooperation among urban stakeholders, which leads to community empowerment.

With social capital, a community intensifies participation in public life, improves socially responsible awareness and enhances local creativity, which results in its transformation into a smart community. The smart community, interested in meetings, discussions, innovations and arts, becomes an indispensable element of a smart city and the base for smart development.

Nonetheless, smart cities strive for innovations in technologies, organisation, and policy. At the same time, smart management and policy are implemented more effectively using the latest ICT. Social innovations that contribute to sustainable development, resulting in a higher quality of life, are often initiated and significantly stimulated by technological innovations. Technology provides an ever-expanding array of social platforms to improve interactions. From this point of view, social innovation involves socialising many groups, especially those socially excluded. Secondly, there is also a positive externality of bringing people closer, virtually or face to face. This leads to other agglomeration benefits, such as labour market matching and information exchange.

Although technologies improve people’s lives in cities, yet they also pose a risk of digital exclusion for some inhabitants. In addition, other problems connected with local social capital can be distinguished, such as social exclusion correlated with a digital exclusion, abnormal familism related to the disturbingly high dominance of technologically advanced small groups and the problem of cliques and ‘power groups’. Therefore one must consciously strive for smart development and prioritise equality so that the smart city of the future is a city for all. Smart cities are now focusing on these goals, and are beginning to consider how these systems can be

integrated to create feedback loops that will improve operations and community members' experience. All this implies social capital advancement by strengthening citizens' participation in addressing their views on the problems and potential solutions in the smart community's decision-making processes.

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