

4G TECHNOLOGY IN BRAZIL AND THE PUBLIC POLICY FOR UNIVERSAL ACCESS AND COMPETITION IN THE TELECOMMUNICATIONS SECTOR

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Abstract

The new demands for the regulation of competitive public services, which have changed several parameters of traditional administrative law in a framework of redefining the role of the state, require the analysis of instruments used in public policies for development. In this context, the telecommunications sector seeks to fulfill two main objectives: universal access and competition. Subsequently, public tenders of licenses to operate 4G technology in Brazil have used a number of expedients, such as the requirement to waive existing licenses or the cross-subsidization incorporated in the joint tendering of frequency bands for rural areas. Through an analysis using a descriptive, inductive and interdisciplinary method, in which we compare the current situation in this sector with earlier national and international experience, we conclude that universal access can be achieved by means of the employed instruments, however, under different circumstances with respect to competition.

Keywords: Development, Telecommunications, 4G technology, Public policies, Public Law

Introduction

In June 2012, an auction was conducted by the Brazilian National Telecommunications Agency (Agência Nacional de Telecomunicações - ANATEL) to publically tender the licenses to use radio frequencies in the 450 MHz and 2.5 GHz sub-bands (the latter are known as 4G technology). Such licenses to exploit a public good represent a significant benefit for the telecommunications sector because they will facilitate a substantive increase in the exchange of data between service users. Therefore, questions have been raised regarding the contribution of this license-granting process to development, which is understood as changes in the economic and social structure (NUSDEO, 2001) and characterized as a process of institutionalizing economic democracy (SALOMÃO FILHO, 2002). Given the recent increase in demand for communications services by consumers, broadband presents an important opportunity to increase related infrastructure. The same phenomenon occurred in the USA, according to Degnan, McLaren and Tennant. By increasing the demand, the transmission area increases, causing gaps between locations. To fill these gaps, providers of cellular services should construct additional sites to accommodate the increased demand without sacrificing the service quality, which requires an efficient regulation that encourages such behavior (1999).

According to Salomão Filho, there are three principles of economic order that enable society to choose between options: the redistributive principle, the principle of dilution of the economic power centers and the cooperation principle. The primary goal of the Brazilian government is to promote development through the adoption of these principles. Thus, its intervention by guidance in the economic field becomes relevant.

In this context, ANATEL's tender of radio frequency bands represents a case of regulation with developmental scope in search of the forced diffusion of economic knowledge. This diffusion occurs by the implementation of the redistributive principle (observed in determining the expansion of service to rural areas by the companies that won the auction) and the principle of dilution of the economic power centers (realized in encouraging competition by dividing the spectrum into sub-bands and lots and by the requirement of waiving the 3G spectrum in the same locality by the winning companies). These circumstances characterize the telecommunications sector, where Law No. 9.472/1997 (the General Telecommunications Law – Lei Geral de Telecomunicações - LGT) adopts the principles of competition and universal access as the policy foundation for the sector.

However, certain questions should be raised, such as the technical basis used for the adoption of this system, because there may be more viable alternatives. For example, could the determination to expand service to rural

areas by the same companies that won the auction, that is, dividing the spectrum into sub-bands and lots and waiving existing licenses (in certain cases, inserted in the public policy for the sector), result in the sector's development, or would this practice discourage investment by forcing investors to make expenditures on activities that are not always profitable? Furthermore, could the desired results be achieved by such instruments, or would a greater liberalization be more practical? These issues, in a broader view, are profoundly linked to a vision of how the state should act in the economy to foster development.

To obtain at least a few answers to these questions and because the research objectives concern examining the reasons for the government's arguments and the consequences of the demands placed on companies, the most appropriate method is descriptive. This method does not necessarily establish the factors that contribute to a phenomenon's occurrence, something that is difficult to determine in the case of social sciences (GIL, 2007). Based on this descriptive perspective, the inductive method also appears relevant. The hypotheses will emerge from the analyses of the current legal scenario in Brazil, of the incentives (from a developmental perspective) and of other cases that used the same instruments. This approach will facilitate a conclusion that can be "reality tested" because it is grounded in concrete cases. Therefore, the use of an interdisciplinary approach is also necessary (DEMO, 2000, p. 65), including mainly concepts from other areas of the exact and economic sciences.

Because the methodological and technical possibilities do not exist, accurate projections are impossible. We intend simply to establish a number of assertions about the public policy to encourage competition and universal access that was employed in granting the new licenses.

Current Broadband Scenario in the Brazilian Telecommunications Sector

Until the implementation of the "Telebrás System" (Brazilian Telecommunications - Telecomunicações Brasileiras - Telebrás), the Brazilian telecommunications sector consisted of several local and regional companies, whose operations lacked coordination. This lack of coordination jeopardized the development of a national network, which was essential for communication. The system's effective implementation between the late 1960s and the early 1970s followed a centralized format with the state monopoly of the union, which was approved by Article 21, XI, of the Federal Constitution of 1988. Such a format was crucial to the development of a national infrastructure, both to coordinate actions throughout the national territory (previously characterized by the disorganization of local actors) and to increase investment (FARACO, 2010).

However, a new context emerged for redefining the role of the state in relation to its duties. Here, the late twentieth-century idea of subsidiary operation was revived for application in the early twenty-first century. The idea was based on economic neutrality and the reduction of state activities (GABARDO, 2009). This new context substantially influenced the rules governing economic sectors related to infrastructure and therefore the telecommunications sector. The transition from the state monopoly to a system of private competition began with Constitutional Amendment No. 08/1995, which amended Article 21, XI, of the Federal Constitution and allowed private companies to participate in the implementation of telecommunications services. The main objectives of this constitutional reform were in tune with the new context. It was sought to strengthen the intervention under the state's guidance in the economy rather than the state's direct operation.

The traditional notion of public service itself has been affected. Because they are linked to the relations between state and society existing in the historical moment in which they develop, legal institutions reflect such a relationship (GROTTI, 2006). Thus, the need to introduce competition in a particular previously monopolistic sector, such as telecommunications, meant that public services could be provided on a private basis. This approach opposes the classical idea of public service in which such a provision would only occur in a public regime (GROTTI, 2006). Actually, this division of regimes, public and private, is at the center of the two principles that guide the regulation of the telecommunications sector: competition and universal access. This sector has two peculiarities that require the public law applied to it to modify itself to maintain its effectiveness: a greater influence of technological advancement and a legal subsystem within the system itself. These peculiarities transform the useless and antiquated legal tools applied in this economic area (MARQUES NETO, 2006). Grotti advises that changes to the state model resulted in a new principle that would be friendlier to the regulation model of competitive public services: the principle of vertical disintegration of the distinct phases or segments of a business (*unbundling*), where the segments provided by competing operators in competition would be distinguished in it. Common to all, the infrastructure, and another singled out, the service itself.

The new system was based on two premises. As previously mentioned, the first one would be the cessation of direct guidance by the state, which counter-intuitively substantially increased its regulatory role. The second would be the legal balance between the two main principles: universal access and competition. Universal access would seek to reach potential users, whereas competition would seek the effective user. Such a balance would be achieved using regulatory asymmetry between providers in

the public system, who would be obliged to furnish universal access, and providers in the private system, who would not be obliged to do so (other than by the possibility of interconnecting networks) (MARQUES NETO, 2006). Therefore, basically, universal access would be provided for the segment in which there would be no infrastructure or access, thus would connecting it to the public service provided in the public regime, and competition would be applied to the segment in which it was possible, with public service provided in a private regime.

After the establishment of this general framework by LGT (before concessions were made), the Union initially enacted a General Concession Plan (Plano Geral de Outorgas - PGO) through Decree 2.534/98 to establish competition in the various regions of the country by creating a duopoly system in each one. Universal access included two situations: individual telecommunications services that should be provided at reasonable fees to any person or organization and other forms of individual access to telecommunications services without the economic condition of paying commercially reasonable rates for individual services. Thus, Decree 4.733/03 established that public policies related to telecommunications services should ensure individual access for all citizens to at least one telecommunication service and the Internet at reasonable rates.

After these preliminary considerations, we can establish the basic normative framework that regulates the exploitation of this public good and according to which the ANATEL auction of radio frequency licenses was conducted. This step is relevant because it will demonstrate whether the legal stimuli in the sector can actually develop the infrastructure. With only several differences regarding nomenclature remaining, the main normative reference is the LGT. Without making considerations of constitutional order will not be considered because there are no doubts regarding the possibility of transferring the service implementation to private agents or the possibility of direct implementation by the Union. The LGT determined that the exploitation of the radio frequency service would occur according to a private regime based on a previous approval from ANATEL (artigo 131, §1º, LGT). Within the relevant adopted public policies, the public good must still be contained in the National Broadband Plan (Decreto nº 7.175/10) and the General Plan of Universal Access Goals for the Fixed Switched Telephone Service (Decreto nº 7.512/2011). This plan has been decisive for the inclusion of the granting of licenses to use of radio frequencies in the 450 MHz band, which are essential bands for meeting the established goals there.

The invitation to tender was prepared with the purpose of implementing the provisions contained in the Decreto nº 7.512/2011 and approved by Resolution N° 516/2008 in compliance with Resolution N° 544/10.

Public Policy Requirements for the Sector at the Invitation to Tender

Already prior to the issue of the invitation to tender, ANATEL was assigned (Decreto n° 7.512/2011) the expansion of access to telecommunications by granting licenses to use the radio frequency sub-bands from 451 MHz to 458 MHz and from 461 MHz to 468 MHz and to require from the grantees counterparts in the form of services to rural and remote regions. Two principals were to be observed: (i) the gradual expansion of the service penetration in rural areas and remote regions through selection criteria based on the lowest price of service plans for the final consumer and (ii) the principle of providing free broadband Internet access in all public schools in rural areas.

Based on the Decree, ANATEL issued the Resolution N° 544/2010 to modify the allotment and regulate the use of radio frequencies in the currently used bands, as well as those that would be tendered, where the joint tendering for use of the 450 MHz band along with the 2.5 GHz band arouse. This joint tender actually reverberates an old expedient in the telecommunications sector known as cross-subsidy, which is the transfer of funds from a one particular segment to another so that the beneficiary segment can pay lower values rates (CÂMARA, 2009).

Because the radio frequency spectrum is a public good of limited resources managed by ANATEL, it fell to ANATEL, within its reasonable discretionary judgment, to decide in a motivated way to jointly tender licenses for the use of the 450 MHz and 2.5 GHz bands. ANATEL's technical department demonstrated that the proposed tendering model would ensure the viability of operations in both bands. Thus, within the presented normative framework, there is no legal impediment to the proposal of a joint tender of the 2.5 GHz and 450 MHz bands. Furthermore, in the case of a joint tendering, the imposition of obligations on the part of the winning bidder is possible. Such a system has been adopted by ANATEL for some time and can be seamlessly implemented with the assumption by the winner of commitments in favor of the community, for example, the implementation of support to provide services in rural areas. Commitments are made based on LGT articles 135 and 136, paragraph 3, among other articles. In this regard, Decree 7.512/2011 determines, regarding the 450 MHz band, that the tender requires counterparts from the winners in the attendance form of rural areas and remote regions.

Another requirement is found in article 11 of Resolution No. 544/2010, which establishes guidelines for the licenses to use radio frequencies acquired in new tendering processes: certain "spectrum" limits should be respected. That is, it was clearly established that to use 4G technology, providers should renounce the use of existing licenses in the same locations, in this case, to use 3G technology. Thus, by limiting the

auction participants, ANATEL promoted competition by encouraging the diverse entry of new providers in the 2.5 GHz band in specific market niches. This restriction is intended to prevent the domination of this scarce public good (the radio frequency spectrum) by one or a few companies and to stimulate competitiveness in the sector.

Finally, Invitation to Tender No. 004/2012/PVCP/SPV was published. In addition to establishing the obligation to waive the use of existing licenses, limits were re-defined in the Invitation to Tender in items. Accordingly, the division of the tendered object into radio frequency sub-bands, which were grouped into lots for auction and of the invitation to tender could be verified. Both measures are aimed at enhancing competition.

Previous National Experience in the Search for Universal Access to 3G Technology and Several Points Regarding Competition And Some International Experiences

Mobile networks for broadband access using 3G technology were implemented beginning in 2007 with two operators on the 850 MHz band. Similar to the tender of 4G technology, which aimed to expand the provision of services based on this technology, Invitation to Tender No. 002/2007/SPV sought to guarantee PMS coverage in all Brazilian municipalities by 2010 and the diffusion of 3G technologies throughout the country by requiring various obligations to be assumed by the concessionaires who purchased the sub-bands such as including a requirement in the invitation to tender related to the injunction to provide service to areas of high interest and to less attractive areas, as described for the 4G technology auction. The result was progress in the expansion of 3G technology for PMS use throughout the country, although the service has not yet reached several less populated regions (PENA; ABDALLA JÚNIOR; PEREIRA FILHO, 2012). However, at the time the initial fixed network system for FSTS and CMS (the mobile service that preceded PMS) was implemented, the adopted mechanisms had perhaps failed to apportion competition. It seems that there was no consolidation of other companies to compete with the companies purchasing the entire previously installed public network. However, there was a substantial increase in competition regarding the mobile telephony market in which these concessionaires disputed the market with groups formed from the duopoly established for CMS, which resulted in a rapid service expansion (FARACO, 2010).

The description of some international experiences in the sector, which used the same public policy mechanisms adopted in Brazil, has a substantial value to be used, if not as a parameter, as data intended for developing assertions about its effectiveness. In an article on the diffusion of mobile telecommunications in Central and Eastern Europe, Gruber states that

for many decades, the telecommunications market was based on a natural monopoly (as in Brazil). This natural monopoly became untenable with the development of mobile technology, particularly with the change from an analog to a digital system. This change substantially increased the efficient use of the frequency spectrum, which expanded the market and enabled the participation of a larger number of competing companies. As a result, the spread of the service accelerated (GRUBER, 2000).

Regarding cross-subsidies in telecommunications, Kaserman, Mayo and Flynn state emphatically that such subsidies are useless for development. Based on an analysis of empirical results, they demonstrate that such policy has no causal relationship with the goal of universal access and observe that subsidies and subscription fees are determined by economic variables such as those described in the theories of competitive market regulation (1990). Conversely, Majumdar and Chang conclude that in the U.S. the funds generated by cross-subsidies were invested by companies in technology diffusion and digital technology development. The subsidies played a positive role in providing the capital that these companies required to expand consumer access (2013). Interestingly, if cross-subsidies are used in a free market only for certain companies while others are prohibited from using them, coercive regulatory intervention is required to prevent the market from destabilizing and damaging competition (FAULHABER, 1975).

The requirements of the Invitation to Tender and the Development issue

The development issue is highly interesting to legal scholars but causes uncertainty because it is important and requires definition. Here, efforts will be made to use the views of a limited number of development researchers, which may contribute to disentangling the central issues: (i) Can universal access and competition with respect to 4G mobile technology and wireless networks generate development? (ii) Could the public policy requirements for the sector regarding the invitation to tender generate universal access and competition, or would other methods be more efficient?

However, it is first relevant to note that communication services are highly important in economic development. Using economies of scale and exhibiting network effects, such services generate benefits that encourage innovation in other sectors in a spillover effect. In this context, broadband has become the most robust platform for facilitating economic development, stimulating innovation in other sectors (DAVIDSON; SANTORELLI, 2010). Regarding the first question, it is important to examine the relationship between the constitution and development. The Federal Constitution and development connote the emancipation of humanity, whereby the Federal Constitution is related to the restriction of arbitrary political power and development addresses the satisfaction of material and spiritual needs

(VIEIRA, 2012). This statement does not address the criticism of certain scholars who have discussed the need to reduce expectations regarding the influence of the law as a component of development, given the complexity of the legal system (BARRAL, 2006).

Development has acquired legal force in Brazil by being elevated to the status of a fundamental goal of the republic, according to Article 3, Section II of the Federal Constitution. This section should be read in conjunction with the other sections of Article 3 because the idea of development should involve not only a guarantee but also development's promotion by the Brazilian state. Accordingly and based on an analysis of the beginning of Article 170, we could state that national development is to be achieved through Brazil's economic order, which is founded on the appreciation of human labor and free enterprise. These factors should support the Brazilian state (artigo 1º, IV) with the ultimate goal of ensuring a dignified existence for all. This goal is primarily associated with the social rights described in Article 6 of the Federal Constitution. The same would occur relative to the purpose of the economic order stipulated in the beginning of Article 170 of the Federal Constitution and with respect to public services, where the state has the duty to act as a regulator (artigo 174 da Constituição Federal) or to provide public services (artigo 175 da Constituição Federal). We could say that such services are related to activities connected with sustainable national development because the effectiveness of such development is closely linked to the social rights guaranteed in Article 6, particularly the infrastructure required for development's realization (SHIRATO, 2005).

In a subjective sense, the idea of development should consider the agents responsible for development or development's beneficiaries because development is linked to fundamental human rights (RISTER, 2007). Well, under this regard, what would be the purpose of the obligation to provide universal access to the telecommunications services if not development because it would create greater access? And the prediction that larger actors will work in the sector through competition?

From this subjective perspective, there is also the developmental theory of Sen. Generally, according to this author, development should be observed as a process of expanding the real freedoms of the people, which would allow for their free status as agents, and this requires the removal of the major sources of their deprivation. The ideal instrument for achieving each freedom is public policy (2000). Not much effort is required to verify that the joint tendering of the 450 MHz and 2.5 GHz bands, which seeks to increase service penetration in rural and remote areas (and thus remove the obstacle of the lacking commercial interest of these areas), aims to expand the economic facility and social opportunity of the individuals who live

there. Increasing competition by dividing the tendering object into radio frequency sub-bands would remove barriers to the entry of new companies into the market and contribute to economic facilities, although from an entrepreneurial perspective. In the U.S., competition has been promoted as the proper means to organize the telecommunications sector, while reflecting the new technological realities and opportunities (TEECE, 1999).

From an economic perspective, these public policy instruments in the search for universal access and competition aim to correct the so-called “market failures”, each in one aspect. In essence, these failures would be ubiquitous externalities, public goods, imperfect competition and inadequate information (MITCHELL; SIMMONS, 2003), which would create inequities in the distribution of wealth, creating inequality. A plausible response to this phenomenon would be public policy. A well-designed state action in this regard would directly benefit the end users of the service (telecommunications consumers) because it would create genuine competition and not additional different prices based on market distortions and produced by random “patchwork” (MARASHLIAN; HANKINS; MCREYNOLDS, 2011). However, several criticisms can be made. For example, neoliberal theorists argue that prices coordinate human activity, and incidentally, the market coordinates better than politics. The markets would be decentralized processes that guide human activity (MITCHELL; SIMMONS, 2003). Because they are inefficient, policy instruments, such as those used in the telecommunications sector, would simply distort the normal course of activity.

From the economic perspective, generally, Furtado begins by observing that development is commonly defined as the increase in the quantity of goods and services during a particular period for a particular community and that quantitative elements are linked to the price system. For Furtado, development must be linked to the increased flow of social income, whose growth is only possible with the increase in productive capacity. In the case of an industrial society, such as present-day society, the accumulation of surplus is in the hands of the businesspeople who reincorporate it into the production process through new techniques, which generates internal market expansion without the need to search for new markets (FURTADO, 2009). Thus, would it not be appropriate to ask whether the expansion of the 4G service to new users through new techniques could not generate increased domestic market and entrepreneurial gains, which would increase productivity and therefore development?

In another perspective, Salomão Filho states that we cannot use a purely economic idea of development because such an idea is only based on efficient outcomes and does not indicate the direction in which the process must occur. This role should be assigned to the law, whose function is

essentially linked to the fundamental values of social organization. Based on this idea, Salomão Filho elects three guiding principles of the development effort, which would enable society to choose between the options listed in the principles of economic order inscribed under Article 170 of the Federal Constitution. The first principle would be the redistributive principle (artigo 170, VII, Constituição Federal), which would expand the consumption by society, resulting in the inclusion in the economical choice process and the elimination of allocative efficiencies in economic knowledge concentration because the database on individual preferences would be enlarged. The second principle would be the principle of the dilution of economic power centers (artigo 170, incisos IV e V, da Constituição Federal). According to this principle, competition should be a fundamental guaranteed value because competition increases freedom of choice and consumer information. Additionally, there should be greater involvement of social groups in the process of drafting regulations. Finally, there is the principle of cooperation (artigo 170, incisos IV e V, da Constituição Federal). This principle's goal would be the reduction of strictly individualistic choices at the expense of social choices, whereby the lack of cooperation should be viewed as an informational problem that is not linked to human nature. (SALOMÃO FILHO, 2002).

Starting from this concept, we clearly envision the developmental scope of the licensing of radio frequency spectra for 4G technology in the pursuit of the forced diffusion of economic knowledge through the implementation of (i) the redistributive principle, which can be achieved by assigning the expansion of 4G service in rural areas to the companies that win the auction, and (ii) the principle of the dilution of economic power centers, which can be realized by increasing competition. Both principles can be observed in the division of the spectrum into sub-bands and lots and in the mandatory waiver of the 3G spectrum by winning companies in the same geographical region. Therefore, after addressing several answers regarding to the question of whether universal access and competition of 4G mobile technology used to providing access through wireless networks would be able to generate development, we concluded, not definitively, that yes, they would be able either by seeking to enforce the constitutional principles and social rights or by allowing the individuals to develop their skills by themselves, either by generating expansion of the internal market, or by seeking the forced diffusion of economic knowledge. In this context, the effectiveness of public services, which are mandatory for development, is necessarily linked to the regulatory activity of the state, which organizes economic activity by intervening through the granting of public services to private persons and regulating their use or by exercising police power by enacting rules and supervising (SALOMÃO FILHO, 2008).

Thus, we attempt to answer the second question (stated earlier): Could public policy requirements for the sector (with respect to the invitation to tender) based on government regulation in the pursuit of development generate universal access and competition?

For universal access, the expansion of the GSM network is required. As demonstrated by a survey conducted by Pena, Abdalla Junior and Pereira Filho (2012), through the 3G technology invitation to tender, which accomplished the same goal of universal access established in the 4G technology invitation to tender (joint tendering involving rural areas), there has been progress in the expansion of 3G technology for PMS across the country. Nevertheless, the service has not yet reached several less populated regions. Evidence of service expansion with compulsory universal access in the diffusion of mobile telecommunications can also be found in Central and Eastern Europe.

No evidence of effectiveness was found regarding the promotion of competition through mandatory waiving of existing licenses and the division of the radio frequencies into a larger number of sub-bands. Most likely, these mechanisms did not achieve their goals because the winning companies were Claro, Vivo, Tim and Oi, which dominate the market. However, as previously described, after the regulation of the sector, there was an increase in mobile telephony competition because the concessionaires disputed the market with groups formed from the duopoly established for CMS, which quickly expanded the service. Thus, we have found strong evidence that the public policy requirements for the sector (expressed in the invitation to tender) in the pursuit of development can generate universal access to the service. Regarding competition, we could not establish a stronger proposition because the only evidence of effectiveness occurred at the time of tendering, not during the development of the market.

Conclusion

The current normative framework for broadband is inserted in a legal system for the telecommunications sector created to stimulate competition and universal access in the face of new demands for the regulation of competitive public services. These demands changed several parameters of traditional public services in a context of redefining the role of the state in the 1990s and require that instruments are adopted through public policies that aim at such stimuli.

Both pillars of the legal system are connected to a broader vision of how the state should act in the economy to foster development. It was concluded that universal access and competition with respect to the 4G mobile technology used to provide access through wireless networks would be able to generate development. as they would realize constitutional

principles and social rights would be recognized, which would enable individuals to develop their capabilities, expand the domestic market and promote the forced diffusion of economic knowledge. Based on these requirements and several decrees and resolutions supported by LGT and the Federal Constitution, ANATEL issued the Invitation to Tender No. 004/2012/PVCP/SPV with three public policy instruments. Two instruments aimed to increase competition: the obligation to waive existing licenses by the winning companies in the same territory and the division of the tendered radio frequencies into sub-bands. The sub-bands were grouped into lots for auction. One aim was universal access through cross-subsidization, which was incorporated into the joint tendering of the 450 MHz and 2.5 GHz bands. The first was designated for rural areas.

Regarding the latter, expanding the use of CMS by expanding its GSM network would provide universal access. This goal could be achieved because of experience with the previous technology (3G) on the national level, international experience with the forced realization of the principle and the use of cross-subsidization. This achievement demonstrates the effectiveness of this public policy instrument. The same cannot be stated regarding the increase in competition. The tender winners were Claro, Vivo, Tim and Oi. These companies largely dominate the market. These companies are rapidly expanding service. However, there is no consistent evidence that their competition benefits the consumer while properly developing the market, perhaps because the process remains at an early stage.

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