GENDER DYNAMICS AND COLONIAL DEPENDENCIES IN THE BELARUSIAN IT SECTOR

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Abstract: This article delves into the complex relationship between colonial dependencies and gender representation in Belarus's IT industry. It highlights how, on the basis of colonialism/modernity, the standard of gender equality in Belarusian IT becomes not the equal representation of men and women, but the performance of first-world countries in the field of gender equality in IT. The study emphasizes how outsourcing, a significant component of the IT sector in Belarus, perpetuates gender discrimination by removing decision-making power and agency, particularly impacting women's ability to advocate for gender equality. Additionally, the article explores the intersectionality of these issues, examining how the commodification of human capital in IT, influenced by past Soviet policies, creates a network of dependencies that hinders the promotion of gender equality in Belarus's IT landscape.

Keywords: gender inequality, resourcification, intersectionality, infrastructures, outsourcing colonialism, gender discrimination

Gender Dynamics in the Belarusian IT Sector

The protests that began in Belarus in 2020, coupled with the increase in repression, and the full-scale war waged by Russia in Ukraine in 2023, where Belarus has a part to play, have led to a new configuration and transformation within the Belarusian IT sector. On one hand, civil society is aiming to assist Ukraine in the war, while on the other hand,

the regime has provided the territory of Belarus for the deployment of Russian military equipment and troops. In 2020, Belarus' GDP was comprised of 7.4% from the IT sector (Medvedeva, 27). The Wall Street Journal (2016) published an article titled "Belarus Is Emerging as the Silicon Valley of Eastern Europe", portraying the IT industry of Belarus as a promising market.

Unfortunately, in 2022, the Russian invasion of Ukraine brought changes, forcing Belarusian IT companies to commence mass relocation. This was described by The Office Life (2022) as "the year of the great exodus". It is currently challenging to ascertain the number of companies and employees that relocated from Belarus between 2021 and 2023. However, there is indirect evidence that suggests that the majority of large companies, whose market was associated with Europe or the USA, have either completely or almost completely left the country. Notable companies in this group include EPAM, iTransition, Flo, PandaDoc, and others. According to a survey conducted by dev.io, the main professional publication in the sphere of Belarusian IT in 2022, only 16.7% of Belarusian IT companies did not implement their relocation program (dev.io, 2022). The current landscape of the Belarusian IT industry is tumultuous. Escalating repression amidst protests, coupled with Russian full-scale invasion of Ukraine in 2022, has catalyzed a crisis in the Belarusian IT realm. Companies are increasingly leaving the country, relocating their employees en masse. According to the annual survey of dev.by — a main media about the Belarusian IT sector — in 2022, 47.7% of IT specialists lived and worked outside of Belarus (dev.by, 2023). Migration in most cases is forced, not "natural".

This mass relocation of IT companies disrupts the infrastructure of Belarusian IT and reveals its mechanisms, power relations, and dependencies. The infrastructure term is based on the prefix "infra-" meaning "sub-" or "under-", implying a structure that is concealed and elusive. This quality is particularly crucial for the information technology infrastructure, where the infrastructure's fracture and rupture reveal its creation and functioning, as well as the formation of power, subordination, inclusion, and exclusion, as noted by Bruce Robbins (2007, 32). Infrastructure is often overlooked until it fails, becoming apparent only when it malfunctions.

In this article, I will focus on the gender shift in one particular aspect of the Belarusian IT infrastructure. My interest lies in the intersectionality of gender discrimination and colonial dependencies that perpetuate their existence and maintenance within the Belarusian IT sector. IT infrastructure, by its nature, often remains invisible, fostering a sense of dematerialization. It's only when disruptions, like breakdowns or interruptions, occur that the work of the infrastructure is exposed. Such disturbances render power and its materiality visible, tangible, and embodied. According to Paul Virilio: "Creation or collapse, the accident is an unconscious oeuvre, an invention in the sense of uncovering what was hidden, just waiting to happen" (Virilio,

2007, p. 9) Through the lens of the Belarusian IT sector, the interplay of destruction and interruption sheds light on the materiality and corporeality of colonial and gendered dynamics.

As we explore the intricate tapestry of colonialism and dependencies in IT ecosystems, another crucial yet often overlooked aspect comes into focus: the role of gender. Gender issues in technology sectors are not exclusive to Western contexts; they manifest in post-Soviet states, enriched by a history of Soviet policies and post-Soviet economic and capitalistic transformations. As Piro Rexhepi noted in the article Our 'Raceless' Region Revisited: "Labour under capitalism is always racialised and gendered but also connected to colonial racial geographies imagining where Europe starts and ends" (Rexhepi, 2023, p. 20).

Examining the Belarusian IT sector through a gendered lens reveals deeply entrenched imbalances. Women constitute just 26.2% of the industry's workforce (dev.by, 2023), a statistic reflecting the barriers they face. Foremost among these challenges is the persistent "glass ceiling". Women's representation in leadership roles remains disheartenningly low, with a mere 7.5% of Team Lead positions occupied by females (dev.by, 2023).

Further, the patriarchal division of labor persists in IT. Women predominantly occupy roles that revolve around caregiving, communication, and service-oriented tasks. A striking 91.9% of all HR positions are held by women (dev.by, 2023). In contrast, men are predominantly stationed in roles directly related to product creation. For instance, 86.3% of developers in the Belarusian IT sector are men (dev.by, 2023).

This gendered disparity becomes critically significant in the context of the ongoing crisis and relocation dynamics of the Belarusian IT sector. Employees engaged in product development are comparatively shielded during turbulent times, benefiting from the core value they provide. Those in service-oriented roles face a higher risk of layoffs. Moreover, during relocation, specialties like PR and HR encounter heightened challenges in securing employment abroad. Their expertise, often rooted in understanding local contexts and nuanced local communication patterns, may not readily translate across borders. The language barrier further complicates this scenario, making the relocation process more daunting for these specialists.

The limited representation of women in the IT sector exacerbates their dependencies, consequently narrowing their avenues for career advancement and financial autonomy.

The second important problem related to gender discrimination is forced migration associated with repression and war. A 2023 research on Belarusian IT professionals relocating to Poland offers illuminating insights. Remarkably, only 21.6% of IT migrants made the move individually (dev.by, 2023). The majority relocated with families, either with a partner or with a partner and children. Of these respondents, 55.4% reported that their partners did not work in the IT domain (dev.by, 2023). Considering that three-quarters of the IT sector is male, this

implies that a significant number of these non-IT working partners are women. Additionally, 30.6% of respondents noted that they were the sole breadwinners for their families in Poland (dev.by, 2023).

In essence, women who accompany their male IT partners abroad often find themselves socially isolated and devoid of independent means of livelihood. This absence of professional integration and financial autonomy places them in an especially vulnerable position. In analyzing past IT migration waves, researcher Elena Gapova, in her seminal article Wives of 'Russian' Programmers or Women Who Follow Men, (Gapova, 2004) sheds light on the understated yet pivotal roles that these women play. Gapova concludes that the activities of these "programmers' wives" are largely "auxiliary". Their potential professional contributions are often determined by how much they can earn if they decide to enter the workforce. These women's decisions, behaviors, and endeavors tend to mold around the professional trajectory of their male partners. They continuously adapt to the familial circumstances and the career demands faced by their husbands, striving to maximize their utility within this framework. This understanding reiterates the gendered dynamics within IT migrations, where women, even if highly skilled, frequently find themselves navigating roles that are supportive and reactive, rather than primary and proactive.

This sociological context is crucial for a deeper comprehension of the multifaceted intersectional dynamics between gender and colonial dependencies within the IT industry in Belarus. The IT industry globally exhibits gender imbalance. In Belarus, this sector is marginalized twice: firstly, as a male-dominated technical field, and secondly, through networks of colonial dependencies. These intersections of gender and coloniality create complexity for women's voices and their struggles for their rights, as they contend with multiple dependencies simultaneously.

Modernity / Colonial Dependencies

In 2023, my colleague Aleksei Borisionok (2023) and I inaugurated a considerable exhibition and research project titled "If Disrupted, It Becomes Tangible" at the National Gallery of Art. There, we examined the political context of extractive and logistical infrastructures, as well as the impact of digital and IT infrastructure on geographies and temporalities affected by wars and political uprisings beyond the post-Soviet condition. In investigating intricate colonial entanglements in connection with the technological sphere within what we have defined as a "beyond post-Soviet condition," we put forward the concept "IT colonialism" as "a political-economic system of distributing resources, profits, and exploitation in the information technology sphere. The geography and lines of IT colonialism are integrated into the global post-colonial logic" (Stebur, 2023).

The study of colonial dependencies in the high-tech field has significantly advanced within the socio-political sciences, as demonstrated by the concepts of "digital colonialism" (Kwet, 2019) and "data colonialism" (Couldry, Mejias, 2019). These denote the deployment of digital technology to politically, economically, and socially dominate another nation or territory. The contemporary colonizers utilize digital technology to establish communication networks, such as social media platforms and network connectivity, primarily for data extraction, profit-seeking, or the storage of data as raw material for predictive analytics. Nonetheless, while these approaches tackle colonialism in technology, their efficacy is also limited. Their research primarily focuses on examining the Global South, regarding digital colonialism as a modern iteration of the "Scramble for Africa" (Coleman, 2019) through the extraction and control of user data by major technology corporations. They examine how data is exploited by these corporations for profit and predictive analytics, treating it as a resource as valuable as natural resources.

Nonetheless, digitization and IT sector development differ fundamentally in the Global South and post-socialist countries, particularly in Belarus. The concepts of digital colonialism and data colonialism are useful but limited in their ability to provide a comprehensive understanding of the issues at hand.

Another point of differentiation is their emphasis on the data itself. Digital and data colonialism refers to the decentralized gathering and regulation of data (The Cipher Brief, 2018) from citizens, regardless of their consent, via communication networks created and owned by Western IT companies (Coleman, 2019). However, Michael Kwet's analysis (2020), which examines not only colonial dependencies resulting from data exploitation, but also infrastructure, focuses mainly on Western companies creating infrastructure in the Global South to cater to their own demands. This infrastructure enables economic and cultural domination and enforces privatized forms of governance. Additionally, it facilitates control of the flow of information, social activities, and other political, social, economic, and military functions mediated by their technologies.

When analysing IT colonialism, it is crucial to investigate the deployment of infrastructures, utilising a cheap yet highly skilled labour force from post-socialist nations particularly Belarus. Of great importance is an examination of how these modernity/coloniality IT infrastructures are constructed on the remnants of Soviet structures. This approach calls for a thorough analysis that takes into account the distinctive historical, economic, and social contexts of post-socialist regions.

Separately emphasizing an important component of IT-colonialism can be characterized as outsourcing colonialism/dependency. It is associated with the structural inequality of IT workers in the global production system, in order to reduce costs, a crucial part of the

production involved developing, coding, moderating of content, etc. distributed to second and third-world countries. As art-group eeefff notices at the Outsourcing Paradice project, "Outsourcing can be considered a radical division of labor powered by the need to cut costs and raise the efficiency of enterprises" (eeefff, 2020-now).

Outsourcing is built on highly skilled but inexpensive labor. As noted by Belarusian-American researcher Elena Gapova, analyzing the situation leading up to the protests in Belarus from 2020 to the present day:

> "With the collapse of socialism and the industrial economy, the post-Soviet space, boasting an educated workforce ready to work for less remuneration (compared to Western engineers), became an attractive place for outsourcing Western orders. Considering this new context and the technological and educational base formed during the Soviet era, the Belarusian government founded the High-Tech Park in 2005" (Gapova, 2021, p. 81).

However, it is known from decolonial optics that colonial dependencies have a significant ideological component. Walter Mignolo (2011) describes this as modernity/coloniality. Modernity serves not only as a chronological boundary but also a spatial one, separating the "modern" and henceforth advanced and progressive territories, the territories of domination, from the territories that require only cultivation and modernization. The concept of modernity/coloniality highlights the indissoluble relationship between modernity and coloniality, considering modernity as an epistemological construct. The IT sector, which is closely associated with innovation, particularly manifests the modernity/coloniality nexus.

The term "Next Silicon Valley" is frequently used in the media to describe Belarus and Eastern Europe, alluding to the region in Northern California that serves as a global center for high technology and innovation. This highlights the connection between information technology and Western influence. Furthermore, it emphasizes the hierarchical dependence of the "Next Silicon Valley" on the original "Silicon Valley" in California.

Being included in the IT industry not only implies accessing its global market but also the ability to quickly adapt and relocate in comparison to other sectors. Furthermore, it involves undergoing processes of westernisation and utilizing an inverted logic where being part of the innovation market equals social innovation or in other words "more advanced" social organisation. This fusion between technological modernity and social modernity can be seen very well in the example of gender discrimination in Belarusian IT.

A 2019 report by dev.by, a prominent publication concerning the IT market in Belarus, bore the evocative title: Women are drastically more. The IT professional turned 30. IT in Belarus 2020, Part 1. A mere 3.2% increase in female representation was seen as significant growth

(dev.by, 2021). Fast forward to the analysis of 2021, where a 26.5% representation of women in Belarusian IT was framed as an overcoming of "uneven gender representation" (dev.by, 2021). The situation wherein thrice as many men were naturally inclined to opt for IT professions than women is described by media as a "balanced", without any glaring gender imbalance.

Why is a workforce comprising three-fourths of men in Belarusian IT perceived as equity by the nation's primary IT media resource? The comparative horizon here doesn't rest upon achieving an equal male-to-female industry ratio. Instead, it's primarily oriented towards US metrics. For context, as of 2021, women in the US held 27% of STEM jobs (The Census Bureau, 2021). In other words, aspirations towards gender equality are intertwined with mirroring first-world country statistics. 27% of women in STEM in become the gold standard of gender equity for the Belarusian IT sector.

The modernity/coloniality nexus in relation to the representation of women in IT creates additional barriers for Belarusian women. At the discursive level, the IT sector in Belarus is depicted as a trend towards westernization. As previously indicated, the gender benchmark for women's representation shifts from an ideal of equal representation between men and women, to aligning with statistics from first-world countries in the STEM fields. The statistical 26.5% of women in Belarusian IT is perceived by society and media as adequate, primarily because it's juxtaposed with first-world countries, which are seen as benchmarks for inclusivity and democratic values. The trap of catching up modernity (Tlostanova, 2018, p. 3) in this case works in a way that further oppresses women. In the public sphere, the struggle for their rights is perceived as excessive, as the IT sphere has already reached the same balance as first-world modernity.

Through the modernity/coloniality nexus, gender discrimination is normalised, since the horizon due to colonial dependencies is not the 50%/50% equal representation of men and women in the field, more transparent hiring mechanisms, etc., but the statistical figures available in first-world countries. However, it is known that IT and STEM are the fields with one of the lowest levels of female representation (especially women in leadership positions). Consequently, with all the understanding of the dynamics of colonial and gender aspects, it is difficult to understand the resistance and demonisation on the part of society and the mass media regarding the voices of women who are fighting for equality in IT in Belarus.

Ruins of Soviet infrastructures and Gender Policy

Despite the fact that modern IT companies and structures in Belarus try to represent themselves primarily as a process of Westernisation, colonialism/modernity. It is important to realise that colonial

dependencies that began to form in the 1990s did not emerge in a vacuum following the collapse of the USSR. Rather, IT ecosystems in Belarus arose upon the ruins of the old Soviet system of research institutes, major technical universities, and large innovative productions. From this perspective, the dependency lines in the IT sector of post-Soviet countries become evident. American researcher Erin McElroy, when analyzing colonial dependencies in the technosphere of former Yugoslav countries, also highlights that contemporary IT "success stories" are not just built on affordable labor but also on the utilization of previous cybernetic infrastructure, "Techno-imperialism has thus meant the cooptation of both state computing and hardware production, factories, and infrastructure, but also techno-deviant practices, not to mention the cheap surrogate labor that outsourcing provides" (McElroy, 2023, p. 136).

Belarus was not an exception in this case. Highly skilled but cheap labour was not only central to IT development in Belarus. It is important to consider IT infrastructure. New and emerging IT infrastructures were literally established on the remnants of the Soviet-era infrastructures. For instance, the High-Tech Park, which instated a special supervision regime for IT companies and set the groundwork for the future "IT miracle", replaced a previous research institute. According to Decree No. 12 of 22nd September 2005 by the President of the Republic of Belarus, clause 4 states that "After the establishment of administration in the High Technology Park following the established procedure, the National Academy of Sciences of Belarus shall transfer the in-progress construction object, Specialized Design and Technology Bureau with Pilot Production of the Institute of Physics, located in the territory of the High Technology Park and assigned to the National Academy of Sciences of Belarus, to this institution for operational management." (Decree, 2005)

Initially, plans were made for a specially designed laboratory and technological bureau for the Institute of Physics to be situated there. Construction commenced in 1989. However, due to the collapse of the USSR, the plan was never fulfilled, and only in the 2010s did the building become the administrative center of the High Technology Park.

At the same time, it's essential to explore how the merging of IT infrastructure with the ruins of Soviet cybernetic infrastructure influences gender imbalance in Belarusan IT. Here, traditional barriers and challenges women face entering the IT domain are compounded by region-specific difficulties. Reflecting on the remnants of Soviet infrastructure, it's crucial to examine the gender policies and representation of women in the technological realm during the USSR era and how this exacerbates gender discrimination in today's IT sphere.

When discussing Soviet gender policies, several key points need to be highlighted. Firstly, addressing the "women's issue" in the USSR was not a consistent, unchanging policy; it's more accurate to speak of multiple configurations of the Soviet approach — from the emancipatory

policies of the 1920s and 1930s to the mobilization of women in the post-war period, and so on. Secondly, as noted by Anna Rotkirch and Anna Temkina, "The Soviet gender order was characterized by the monopolistic role of the party-state" (Rothkirch, 2009, p. 172). Consequently, there was a stark contrast between the ideological façade promoting gender equality in the USSR and the actual conservative gender role division.

It is important to trace the correlation between the development of cybernetics in Soviet Belarus and transformations in gender policy. The fact is that interest in cybernetics in the BSSR began in the late 1960s: in 1965, the Institute of Technical Cybernetics of the BSSR Academy of Sciences was established, and in 1975, the Special Design and Technology Bureau with pilot production was created. During this period, the Soviet state underwent a transformation in its gender policy, focusing on women's reproductive and productive roles. In other words, on the one hand, the state maintained women's traditional or patriarchal role as mothers, addressing the issue of population replenishment, which had been depleted as a result of World War II. On the other hand, it mobilized women for active participation in complex production processes. For instance, in the iron and steel industry, where only 15% of the workforce was female in 1939, women made up 40% of the labor force by 1944 (Darbaidze et al, 2023, p. 3). In essence, the gender policy of the time can be described in terms of "resourcification": "Instead of focusing on protecting women's rights and expanding their economic opportunities, was aimed at mobilizing them to secure the national economy" (Darbaidze et al, 2023, p. 7).

Such a stance on gender policy, where women were perceived as a reproductive and workforce resource, is crucial for understanding where and how gender discrimination took shape in the USSR. This discrimination continues its inertial motion in today's IT sphere. Although women nearly occupied half of the positions in scientific and technical specialties, their actual representation in terms of vertical mobility and career growth opportunities was not characterized by gender equality:

> "Vertical and horizontal segregation persisted in the workplace. Women typically worked in middle and low-level positions and rarely attained powerful leadership positions. Women were also allocated less-technical and jobs of a more administrative nature dealing with paperwork, communications, and people" (Rudenko, 2022, p. 58).

Several factors underpinned this situation. One was the downgrading of the status and prestige of highly skilled engineering positions due to the wage policies implemented by the Communist Party. The salary of highly skilled staff was often on par with engineers' salaries, rendering engineering and technically intensive roles, especially those of line staff, less prestigious and appealing (Arefiev at al,

2012). This fostered a low-competitive environment with a higher female presence. This situation would become especially relevant after the USSR's collapse and the subsequent rise in the prestige of scientific and technical specialties. For instance, by 2010, only 7.5% of the IT workforce in Belarus would be women (dev.by, 2021).

Returning to the wage structure of scientific and technical professions in the late USSR, it's important to note that leadership positions in such fields, on the contrary, were very well compensated. This was largely since the majority of scientific and technical organizations had direct ties to the military-industrial complex. Thus, leadership roles came with what can be termed "general's salaries". Another crucial aspect was the patriarchal gender policy — the concept of women's labor and motherhood as "civic duties" mobilized by the state (Rothkirch, 2009, p. 179). The militarization of scientific and technical professions, with its pronounced male dominance, combined with the portrayal of the woman as a mother and the diminished prestige of engineering professions (stemming from wage equalization policies between highly skilled and low-skilled workers) — all these factors created a constellation of gender segregation. At a cursory glance, it might seem that women were actively represented in the Soviet scientific, technical, and cybernetic domains. However, they faced challenges in vertical and horizontal career mobility, professional prestige, and so on.

The Soviet state succeeded in integrating women into engineering fields by addressing the workforce mobilization challenge through widespread access to technical education and ensuring a prominent representation of women in these areas. However, it failed to confront and tackle the pervasive vertical and horizontal gender segregation, an issue rarely discussed publicly. This approach revealed its fragility and vulnerability to external disruptions when Belarus became an independent state. According to statistics, Belarusian women in IT were mainly engaged in care and service labour, e.g. in Belarusian IT women HRs were 91.9% (dev.by 2023), while managerial positions are represented mainly by men, e.g. women are practically absent on the board of directors of companies and only 7.5% of all team leads are women (dev.by 2023). In other words, when the IT profession once again became prestigious and highly compensated, without being fortified by a genuine fight for women's workplace and political rights, women's representation in this sector dwindled.

Conclusion

Analyzing the intricate interplay between colonial dependencies and female representation in the IT sector in Belarus, several key points emerge:

Firstly, the modernity/coloniality creates dual position of gender equality in Belarusian IT: in the realm of political imagination, it is

seen as an "advanced" domain in post-socialist nations, embodying the vanguard of westernization/modernity. Yet, when it comes to gender representation, the discourse ties achievements in gender equality not to equal representation of men and women within IT, but primarily to comparisons with the current female representation in Western countries, which is often taken as a benchmark.

Secondly, The topic of outsourcing has been touched upon many times above, but here I would like to expand on it more and emphasize how outsourcing, as one of the elements of colonial dependence, affects gender discrimination in Belarusian IT. First of all, it should be noted that Belarus, like many countries in Eastern Europe, has a large share of outsourcing in the IT sector. In 2016 the share of outsourcing companies in Belarus was more than 60% (BIK Ratings, 2020). Outsourcing is not just the use of cheap labor, but, above all, an economic regime in which all centers for making strategic and managerial decisions are excluded, removed from outsourcing centers — both structurally and geographically. That is why, through outsourcing relationships, it is possible to show, as noted earlier, how IT becomes part of colonial processes. It is the presence of a dependent position that also takes away agency from women to fight for gender equality in IT.

It's also crucial to highlight the intersectional lens: the resourcification of human capital in IT, juxtaposed with Soviet policies that resourcificated women based on their productive and reproductive functions, weaves another intricate dependency network. This network challenges the advancement and support of gender equality in Belarusian IT.

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