INNOVATION METHODOLOGIES
FOR DEFENCE CHALLENGES

It is usually the job of the defence sector to make sense of the security environment, to assess its dynamics, and to build up the necessary capabilities. It is also our responsibility to convince society that they have to devote resources for their defence and that these resources would be used efficiently.

It sounds like an easy job, but if it were, then probably only successful armies would exist. Since it is not being the case, let us just agree, that we need the best brains around and the best concepts at hand to succeed…

Today the availability of necessary information is not the matter of probability anymore. Unlike in the Middle Ages, we literally swim in data and as a result, collectively we are becoming increasingly capable of making strategic decisions or responding to events in a range of dimensions from social and economic problems to biology. Thus, networks are becoming more important than individual knowledge and this development leads us, mankind, to a more connected and more complex world, than ever before.

What are the implications? Well, for one, time and distance cease to be a decisive factor. A traveller departing from Berlin and travelling one single day on horseback, could reach the North Sea in 1819, the French border in 1906 by train, and Moscow in 2015 by airplane. Distance and a relative cost of travel is vanishing in the globalization. Reducing the importance of time and distance is also ultimately necessary for maintaining the current extent of the global value chains, which in turn act as the fundament of the technological and economic development on a global scale.

Speaking of technologies, today, we observe an exponential, albeit slowing, rate of technological change in accordance with Moore's law, where humanity is increasing its computational ability by roughly 60% each year. This provides a solid basis for the growth of productivity which in turn, fuels economies.

As a net result, data are everywhere. According to IBM, 90% of the data available in 2017 was created in the matter of two years. We generate 2.5 quintillion bytes of data every year. In nominal terms this equals to the number of all ants on the planet multiplied by 100. According to some estimates, by 2020, every person had generated 1.7 megabytes of data every second.

What kind of consequences does all this have? For one, while our world is shrinking and our knowledge is growing, we are struggling to make sense of it. Thus, we face here a technologically induced paradox: we know more about the world, but that world is increasingly complex. In light of this complexity, we need to learn more, think more and act more.

On the one hand, in the realms of defence, traditional, linear approaches do not work anymore and the facets of strategy are changing. The dichotomy that we all were taught at school, like phalanxes versus legions, David versus Goliath, blue versus red does have increasingly limited validity today.

Adversaries of the global military hegemon, the United States, adapted well to the arithmetic of modern warfare (that is, any tier 1 army can defeat any tier 2 or 3 armies in the world if pitched against each other in a structured manner) and so they avoid choosing linear options and direct strategies. This has a strong impact on the possible employment of the

Hungarian Defence Forces, as an Allied Army, as well. The new modus vivendi has many names, from hybrid warfare to grey zone, but its most important attribute is its non-linear and asymmetric nature. It also operates in the vast and complex space between peace and war and so it severely stretches the ability of global arrangements, legislative systems, and alliances to adapt to this new reality, which in turn, could cripple our ability to cooperate with each other in the not so distant future. The bottom-line here is: if we do not understand it, we cannot tackle it together.

On the other hand, technological changes are altering the material landscape of war. We observe an accelerating cycle of innovation for many weapon systems, most prominently command and control and sensor systems, AI as well as autonomous systems and finally, drones. Rapid technological advancement can limit our ability to employ our existing weapon systems with the greatest possible effect if we do not follow the innovation race. But if we do, this may impose on us costs that we cannot endure. Does it pose an economy of scale problem? Do smaller nations have a chance to keep up with the furious tempo of innovation? How are our own efforts stacking up into collective result?

Thirdly, terrorism is changing as well. Today a terrorist or a terrorist organization can rely on the same set of technological achievements which are enabling the prosperity and welfare of our societies. The availability of such technology is a common good for all of us and it is impossible to deny it from people with harmful intentions. A drone which is for sale for any of us on eBay may easily be transformed into a kill chain weapon system through minor adjustments. New, dual-use technologies, if applied as weapons, possess increased lethality. The range and reliability of remote control technologies also increased exponentially. These tools are mostly concealable, portable, and easy to use. Conventional weapons, like explosives and fire-arms, are also easy to obtain, especially in those regions, where instability reigns. I shall add here, that the number of such regions is increasing steeply.

Finally, as time and distance are vanishing, interconnectedness creates new points of mutual vulnerabilities from pandemic diseases to the collapse of the current climate. This creates a strong interdependency between far away locations and globalizes local problems, thereby also complicates them even further. It also creates many new types of vulnerabilities.

So, here is the second paradox, which is induced by technology. As the welfare of mankind is increasing, it seems that several global variables, including war itself as the most prominent for us, are undergoing their own evolution. As war remains inseparable from its larger context, the global ecology, it is gaining complexity at least at the same speed. Accordingly, our job to understand it becomes more difficult as well.

I personally do not think that we really understand how wars develop, why we have so many of them, why not a big one, like a world war. Where is the threshold between war and peace? What can we do about it? How can we prepare our forces to a constantly changing landscape? How can we train highly rigid organizations to be flexible by design?

What I do exactly know, however, is that these are some of the questions which I am sure will be asked and answered through this special issue of the journal.

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