Executive Summary – The Last Mile
by John Verdon, National Defence Headquarters, Ottawa Canada.

This paper continues to explore the implications network-enabled capability and particularly of peer-production as presented in the previous paper Understanding the Impact of Network Technologies on the Design of Work – Social and Peer Production.¹

Our central argument is that network technologies and new insights based on the development of complexity science represent a dramatic disruptive challenge to industrial organizational structures and processes, in general, and to human resource and personnel management in particular. These technologies provide a new and evolving social architecture of participation and infrastructural capability inciting the emergence of new concepts of how organizations are structured, how people can be managed and developed, and how learning and work can be accomplished. This paradigm shift mirrors the decentralization of control instituted by the political and social movements away from command economies toward political-economies embracing more balance market systems which anticipates the evolution of the industrial control-hierarchy organization to a network-enabled complex adaptive organization within a dynamic and evolving network of networks.

A key metaphor to help us understand the traditional approach to designing an organization is the concept of a machine. The traditional organization is designed as an engineered machine and depicted as a control hierarchy. However, the control hierarchy limits the complexity of possible collective behaviors of the system. Increasing the size of the organization and/or variety within it both increases coordination costs and limits internal complexity. At each level of the hierarchy, local control/coordination must be passed upward through the local controller until to highest level is reached. This implies that the collective actions of the system in which the parts of the system affect other parts of the system must be no more complex than the controller. In human hierarchies the collective behavior must be simple enough to be represented by a single human being². This limits the span of control to that which an individual can effectively manage. Trying to mitigate this limit with more managers and correspondingly reduced spans of control is useful to the point where collective behavior required by the organization increases in complexity that is beyond the capacity of the highest level of the control hierarchy. The hierarchy amplifies the scale of the behavior of the controlling behavior but it does not increase its complexity.

Organizations operate within environments that in turn can vary from stable and relatively stable to dynamic changing and highly complex. If environmental complexity changes and begins to exceed the internal complexity of the organization then the chances of failure loom high unless the organization endeavors to increase its internal complexity sufficiently to be able to generate successful response to environmental demands. This is the classic role of competition (as a means for creating sufficient variety) in both evolution and the working of the market system.³

² Ibid
³ Ibid, Figure 1 below is an unmodified version except for the title.
The machine-organization determines the hierarchic and occupational structures framing a highly specified division of labour, which in turn define relatively linear career trajectories. The design is top-down, separating the designer from the tool. The purpose of the machine as organization determines the required inputs and expected outputs. Although labour is viewed as an input, the worker is transformed into a replaceable ‘cog’ (task-specified job) constituting the machine and enabling it to function effectively. The worker, as any other ‘part’, is replaced as needed. Of course efficient replace-ability implies a high degree of standardization. Human resource management continues to be largely determined by this organization-as-machine schematic. In stark contrast, the metaphor more appropriate to the 21st Century (embracing complexity and rapid, continuous transformation) is to understand and design the organization as a complex, evolving system.

We believe that the knowledge of the military profession resides primarily in the minds of its members. Essentially the most important resource of the CF and of any 21st Century organization is its people – its human capital. There is an imperative to understand this capital, the investment made to obtain, develop and use this capital and most importantly to continue to generate increased human capital capability. Human capital is the source of capability and wealth of any society and organization.

Network technologies, architectures of participation and peer-production allows the knowledge of the profession-of-arms to flow from those who know to those who need to know, from those with specific experience to those who need that experience right now. Peer-production enables the quality of the relationships between members of the community to grow, and in turn enables members to determine how and where they can further serve other members. Peer-production helps enable context of trust to emerge and additional knowledge to flow – increasing the organization’s ‘social capital’. Relationships, trust, and a sense of professional community (as social capital) are critical factors that set the conditions for effective connections and conversations and set the stage for current and future operational agility and increase the speed of operational cohesion. Peer-production enables a tightly connected, decentralized network of leaders to quickly link members to knowledge and resources that might otherwise be inaccessible.

The challenge in developing a space for a richer more agile layer of connections within the organization is a question of finding the right way to integrate a market-like capability with the traditional control hierarchy. The imperative to create such a layer includes the benefits of:

- Reduced coordination and control costs (time, effort, people) – more teeth less tail.
- Integrates continuous learning, and thus power effective operational agility
- Leveraging much more of the human capital that we already invest so much to develop
- Increasing the pool of available skills, knowledge and judgment that can be brought to bear – to allow the organization to marshal more of its human capability/capital for productive and operational ends
- Better capability to generate integrated security solutions

In addition, to the gains Network technologies, architectures of participation and peer-production would enable the CF/DND to increase member/worker engagement, continuity, extend specialization, increased productivity and a culture of collaboration. For example:

- Engagement: by being able to pursue the (work-related) interests that they are serious or passionate about, workers experience engagement
- Continuity: by mitigating the internal 'fog and friction' of the posting cycle as important transformation initiatives can achieve greater continuity by the support and augmentation enable by peer-production
- Extended Specialization: the specialization of talent and therefore the division of labour can be extended beyond the limits of the occupational structure of the organization
Increasing productivity
A deep culture of collaboration consistent with the doctrine of command intent and self-organization and embedding within leadership at all levels experience with achieving effects with resources they do not directly control.

The concept of creating a market-like peer-production space within the organization that would also provide an emergent internal capability to match the external environmental complexity is simple. Each member has control-ownership of a portion of their time to contribute to the organization as they see fit. This is the concept of the ‘last mile of the market’. The member-owned portion of their time in conjunction with enabling network technologies would provide the organization with a market-like corporate-level resource pool, group-forming network, and peer-production4 space – the last mile of the market.

In essence, peer-production within an appropriate organizational paradigm is a human capability multiplier - it can allow the CF to ease it management burden, leverage the professionalism of its people, mitigate the friction of the posting cycle and the turbulence of continual transformation and training. Furthermore, network-enabled capabilities shift the organizational focus from an emphasis on control via the chain-of-command to a command centric web of distributed control. This also means less tail, more teeth, more types of teeth, and better prepared teeth.

The imperative to conceive and design an organization as a complex evolving system has significant implications for all aspects of the very complex human management system including its occupational structure, training, and learning. HR must be able to facilitate the development of integrated security solutions and a system that enables the CF to marshal its own human capabilities, where and when needed. The use of network technologies, architectures of participation and peer-production can power an organizational ‘overlay’ of a new type of agile and fluid pool of labour and highly adaptive divisions of labour. Using the untapped human capital within the organization, the CF can create a type of virtual layer, where people can ‘pursue their interests’ and self-select to contribute to projects that feed their interests, abilities, passions or curiosity in a digital division of labour, while continuing to fulfill the obligations of the traditional layer of occupational/operational jobs and work. In this way the last mile of the market is not necessarily a ‘coup’ even if it is a revolution. This is consistent with the ongoing challenge of transformation – running the organization and changing the organization.

---