Regulatory Framework for Dairies

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Abstract. This paper dwells upon the regulation of dairy industry development in its digitalization, a problem that has yet to be solved both in theory and in practice. One aspect to this solution lies in developing an unconventional approach to a theoretical framework for regulating the industry and in making the guidelines for that framework. The research builds upon a cognitive technology that optimizes daily office routine: document processing, publications, reporting, declaring, etc. This helps automate information retrieval from online sources and sample the most representative data. Data analysis uses a priori ranking. The novelty of this research lies in the fact that it proves the proposed risk management method to be a feasible solution for dairy industry regulation during its digitalization. Milk production will be improved by mitigating the digitalization risks, which in turns will be enabled by cutting-edge digital tech and resource-saving technologies. The proposed risk management-based regulatory framework can become fundamental to the industrial digital system. The databases and knowledge the system will provide could be of use for local, regional, and federal executive authorities for developing and optimizing a policy to support dairy SMEs.

1. Introduction

New approaches are what must be set forth in the policy documents on the digitalization of the dairy industry, which in its turn must boost dairy production and consumption [1, p. 257].

Today, the agro-industrial complex (AIC), especially SMEs and cooperatives [2], is facing difficulties. The following trends are of particular importance: insufficient overproduction of foods, malnutrition and famine, as well as agriculturally induced environmental issues.

For instance, China’s dairy industry had to receive consolidated governmental support after 2008, mainly due to food security issues [3, p. 303]. Subsidies are one of the tools for creating a concentrated market to tackle regulation risks and provide quality assurance. Innovative modernization of Russia’s dairy industry is the key factor of the nation’s food and environmental security in the context of greater focus on exports. The goal of the study [4, p.73] is to test the feasibility of a dairy industry development concept proposed for Russia as well as to make projections on how it will function when backed by cutting-edge technology. Years of reforms have brought the country’s consumption of milk and dairy products to a record low. To address this situation, the dairy industry needs modernization, especially when it comes to dairy farming. This will require additional investment [5, p. 28].
Belarus supplies cheaper similar products to Russia, which hinders the latter’s dairy industry; importantly, importing countries provide considerable governmental support to such industries.” [6, p. 10] Therefore, Russia’s dairy industry will need greater governmental support, if it is to succeed [7, p. 31]. In turn, there must be a framework for finding out how such support affects the key performance indicators of the industry. The most appropriate form of such framework is that of a digital model.

The goal hereof is to propose an original dairy industry regulation concept, to develop a model, and to devise a framework for its application.

2. Methods and materials

The research builds upon a cognitive technology that optimizes daily office routine: document processing, publications, reporting, declaring, etc. This helps automate information retrieval from online sources and sample the most representative data. Data analysis uses a priori ranking.

3. Results

Information and communication technology (ICT) is a promising tool for the AIC in general and for the dairy industry in particular. Some of Russia’s agricultural SMEs have already digitalized their farming, see Figure 1.

Figure 1. Dairy industry digitalization tools [1, p. 259].

Dairy SMEs deploy cutting-edge software and digitalization systems to continually receive data from the Internet, i.e. to collect data from any location in the world at any time. If farmers have round-the-clock access to weather forecasts, they can optimize the application of chemicals to protect crops while also mitigating the environmental risks associated with the production of feed.

Pastoralists can track every aspect of their farms if every animal has a processor connected to the Internet. Various electronic devices placed at specific locations at a farm will provide real-time readings.

However, small and medium-sized agricultural enterprises and cooperatives are not able to use integrated information and computer systems (ICS), as such systems are costly, while deploying them might be even costlier by several orders of magnitude [1, p. 260]. However, optimal use of ICT mitigates the economic risks and improves:

- response time,
- coordination and coherence of action;
- production rates,
- product quality.

An intensive and efficient dairy industry needs [8, p. 35]:
- cutting-edge milk and dairy production processes,
- better IT support for controlling such processes.

Factors that hinder dairy industry digitalization are associated with risks. Assumingly, the regulating the digitalization of this industry is a digital economy (DE) risk management process. Paper [9, p. 386] proposes a risk classification, which suggests that for the digital economy, the most specific risk is the technology risk [10, p. 105].
Technology risks are defined as risks associated with the large-scale and rapidly accelerating DE processes the result in ICT development and deployment; these processes cannot be stopped or decelerated, as they fuel themselves. Such risks can ‘avalanche’. Technology risk management in the dairy industry requires a strong focus on infrastructures and cutting-edge technology used by diary producers and processors: state-of-the-art computing, software, and skilled workers.

4. Discussion

Confidential information, trade secrets, personal data, and processes are essential to protect against malevolent interference [9, p. 387]. Such protection applies to financial documents, trade agreements, and automated process control systems. Shall a competitor or a foreign agent steal or destroy accounting data or legal contracts, any digitalization-enabled dairy company will be a risk of shutdown.

The danger that innovation and diversification risks pose is the change of the industry becoming dominated by stronger and richer foreign actors in the market that will enforce receivership [10, p. 106]. This risks manifests as an avalanche of investments, startups, e-money, novel industries, the ‘facelift’ of older industries—processes that are induced other countries and have a considerable impact of the nation’s economy, industries, and individual companies.

An innovation risk management algorithm for the dairy industry is an accounting and analytical data collection system. The developed algorithm for managing the agriculture’s innovation risks pertaining to digital economy comprises 5 blocks [11, p.67].

Comparative analysis of risk classifications for conventional and digital economies shows that social risks have a lot in common, but are nevertheless different. These are mainly income and unemployment risks. Income-related risks are prone to rapid change in a digital economy. This is why the authors hereof have proposed a dynamic model of social risks for DE [12, p. 376].

Paper [13, p. 781] analyzes the risk of losing jobs over a six-year timeframe; it is the first to analyze how employment factors affect the numerous well-being and job satisfaction indicators in the context of losing a job. Many experts believe that automation and robotics will result a large-scale unemployment within three to five years. This will inflate the risks of job loss. Psychological risks are defined as risks associated with the large-scale and rapidly accelerating DE processes the result in ICT development and deployment; these processes have already produced two ‘digital’ generations [14, p. 260].

Clip thinking is a recently coined term [15, p. 1659]. Thinking becomes fragmentary, ‘clipped’. Man learns to perceive the surrounding world as a kaleidoscope of non-connected facts and images; he becomes addicted to continuous inflow of data while not grasping the essence of information [14, p. 260]. If a person fails to understand a topic, they will find another one, then another one, yet being quick to forget whatever they have just learnt. People start losing a general meaningful view of the world, a common ideal and the values it holds, which affects human behavior [16, p. 105]. Analysts of an American intelligence agency [17] predict the ‘cyborg era’ is nigh.

DE risks can be mitigated by deploying cutting-edge tech and technology to boost milk production performance [18, p. 65]. According to N. Volodina and S. Golovina [19], raw milk prices averaged 3.53 and 12.02 rubles per liter in 2000 and 2010, respectively, 19.06 and 21.20 rubles per liter in 2014 and 2016. Pasteurized ready-for-consumption whole milk (2.5% to 3.0%) was priced 9.7, 31.99, 43.81, and 51.44 rubles per liter on average.

5. Conclusions

Cognitive technology-based analysis of digitalization has identified and classified the major risks of digitalization of the dairy industry. The paper hypothesizes that the industry could be regulated by a DE risk management framework. Testing the hypothesis will require:

1. A profound analysis of the dairy industry on data sampled from one Siberian Federal District (SFD) region, in particular from Novosibirsk Oblast (NSO), to identify the trends.

2. Assessing the industry’s digitalization and hypothesizing on how it could be effectively regulated.
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