SUPPLY CHAIN MANAGEMENT IN TIMES OF COVID-19

Best practices in Supply Chain Management

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The measures put in place in Switzerland and around the world to limit the spread of COVID-19 have profoundly affected supply chains, which have been expanding globally since the 1980s. This unprecedented disruption has exposed the many flaws in today's supply chains, but it has also demonstrated the resilience of some industries, which have been able to react very quickly. Based on a survey submitted to Swiss SMEs, this exploratory study aims to highlight the best practices in supply chain management, and to provide direction for companies in designing resilient supply chains to be able to continue their activities even in times of crisis.

Supply Chain in a global context

Driven by the globalization of trade to deploy their activities across national borders, companies have seen their supply chains become increasingly complex, to the point where they have become vast structures that are sometimes as indecipherable as they are uncontrollable. This geographical dispersion and fragmentation of supply chains has led to an increase in their fragility (Tite, Chanson, & Gaultier-Gaillard, 2014, p. 2). If this vulnerability was usually observed mainly through global scandals linking certain companies to the activities of their subcontractors, such as the well-known cases of Nike, Gap, H&M, Walmart and Mattel, and problems of violation of union rights, child labour, and racial discrimination (Andersen & Skjoett-Larsen, 2009, p. 77), an unprecedented event has also brought to light numerous failures within supply chains: the COVID-19 crisis.

During the summer of 2020, an exploratory study conducted by the Haute école de gestion Arc (HEG Arc) looked into the impact of the first phase of the crisis for Swiss companies and the strategies put in place to deal with it. As a study by the Swiss IPG Partners Group conducted in parallel targeted large companies, the research team decided to focus on SMEs, i.e. companies with less than 250 employees[1]. A survey in French and in English was sent to a list of email addresses created by the research team, and the survey was also shared through LinkedIn. While this method collected 111 responses, only 35 could be considered as valid and therefore retained for the analysis. This was due to the fact that some respondents did not fit into the SME category and others did not complete the questionnaire. The sample is mainly made up of industrial companies in the Arc jurassien, which is linked to the territorial anchorage of the HEG Arc and the email address database available to the research team. Following this online survey, five semi-directive interviews were carried out in order to deepen certain results with companies that participated in the questionnaire; these were selected with the aim of varying the profiles as much as possible. This article presents the main findings of this exploratory survey. If the number of answers does not of course allow an extrapolation to the totality of the companies, certain results offer however useful tracks of reflection to reinforce the supply chains in a crisis which, at the time of writing, seems still very far from its end.

Supply Chain vulnerabilities

The first question in the online survey asked participants to rate the impact of the COVID-19 crisis on their activities using a 5-model Likert scale. Figure 1 shows that the maximum number of responses focused on score 4. This represents the median value, which means that this score divides the sample into two equal parts (i.e. as many responses are below as above this value). Therefore, it appears that, although some companies have been little

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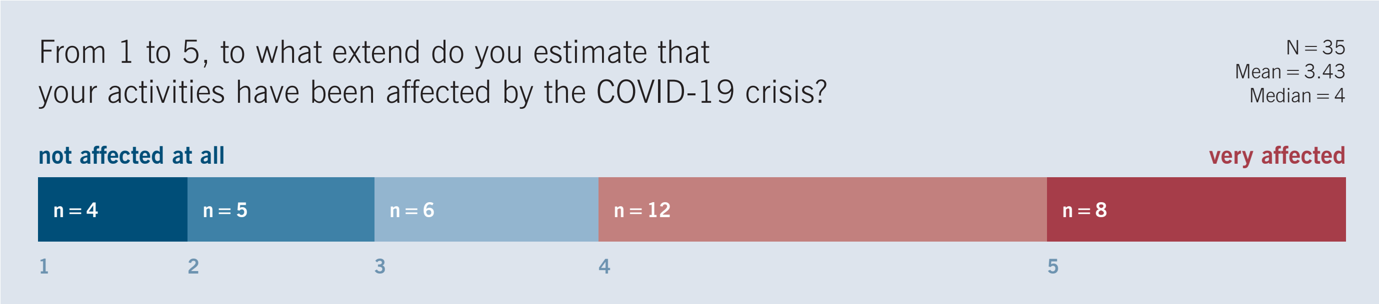

Figure 1: Impact of the crisis

or not at all affected by the crisis, the effect of the crisis appears to have impacted most of them. Let us recall here that the majority of responses were collected between July and August. Considering the persistence of the crisis, an updated study would probably find an average even higher than this already high value. Finally, still on this question, a closer analysis of the results reveals a slight correlation between company size and the impact of the crisis. Indeed, it seems that the more companies have employees, the more they have been affected by the sanitary situation. However, this trend could not be considered statistically significant, i.e. the link between company size and vulnerability would require more respondents to be validated or challenged.

The questionnaire then focused on the concrete effects of the crisis on companies' supply chain activities. Participants were asked to estimate the degree of vulnerability of their supply chain based on 15 items selected from a literature review. Figure 2 presents the results and ranks the responses according to the average score given to each category, from the most vulnerable to the least vulnerable (the number of responses is indicated to the right of each item). With an average score of 3.6 out of a maximum score of 5, the «No or poor forecasting» item stands out clearly from the other responses. It is also interesting to highlight that four of the first five responses directly concern the relationship with customers and suppliers. As far as demand is concerned, the semi-directive interviews confirmed the difficulties inherent in establishing forecasts. Indeed, as most companies look to the past to estimate the future, the pandemic has further accentuated the uncertainty that was already part of the prediction exercise: *"customers did not want to provide forecasts, whereas they usually give good ones"* (Benjamin Rindlisbacher, head of the sales back-office at Camille Bloch). On the upstream side of the supply chain, the results presented in Figure 2 show that "Dependency on suppliers" and "Frequent delays of suppliers" are also among the elements considered most vulnerable by participants. Thus, a supply problem can have cascading repercussions: *"if one component is missing, it creates delays on the entire supply chain"* (Bruno Pedrazzini, Operations & Planning Manager at Parmigiani).

Measures to respond to COVID-19

To find out how companies reacted to the crisis, the questionnaire submitted a list of measures to participants based on a literature review. Participants were asked to indicate the measures implemented in three ways (implemented before the crisis, implemented during the crisis and not implemented) and then to evaluate their effectiveness – from 1 (not at all effective) to 5 (very effective). Figure 3 groups all the results and ranks the proposed items according to their effectiveness. It should be noted, however, that some of the scores are based on very low numbers, as measures that were rarely implemented logically received little evaluation of effectiveness.

With regard to the first part of this question, many measures had already been implemented by companies before the crisis (in red in Figure 3). Thus, 22 respondents (out of 35) indicated that they had already developed close collaboration with their suppliers, 21 had done the same with their customers, and 20 had analyzed their dependency on their suppliers (identification of 1st and 2nd tier suppliers). The semi-directive interviews confirmed the importance companies attach to increasing visibility in their supply chain: *"we have a good mapping of our suppliers. It is work that we have been doing for a long time, in order to have a better traceability on our products and to make responsible purchases"* (Christophe Pot, Director at Spontis SA). For the most rarely implemented measures (in blue in Figure 3), it is very interesting to note that the least cited elements concern all the new technologies. Thus, among the companies in the sample, not even one indicated that they use "smart contracts based on blockchain technology" or "data-driven decision-making", and only two companies use the "Internet of Things". Three elements can explain this limited deployment of new technologies. First of all, during the semi-directive interviews, managers explained that, despite their desire to increase the transparency of their supply chain, they lack time to develop these technological tools. Other participants declared that they see few advantages in the approach and fear an unnecessary complexification of their supply chain: *"the risk is to set up a process too complex for few results"* (Christophe Pot, Director at Spontis SA). Finally, some see the adoption of new technologies as being hindered by a high dependency on their most important customers. Indeed, customers sometimes withhold certain information, such as sales figures. Still on the first part of the question, the analysis of the answers allows us to discover which measures were favored during the crisis to reinforce the resilience of companies' supply chains. Among the

1 www.kmu.admin.ch/kmu/fr/home/faits-et-tendances/politique-pme-faits-et-chiffres.html (accessed 28 October 2020)

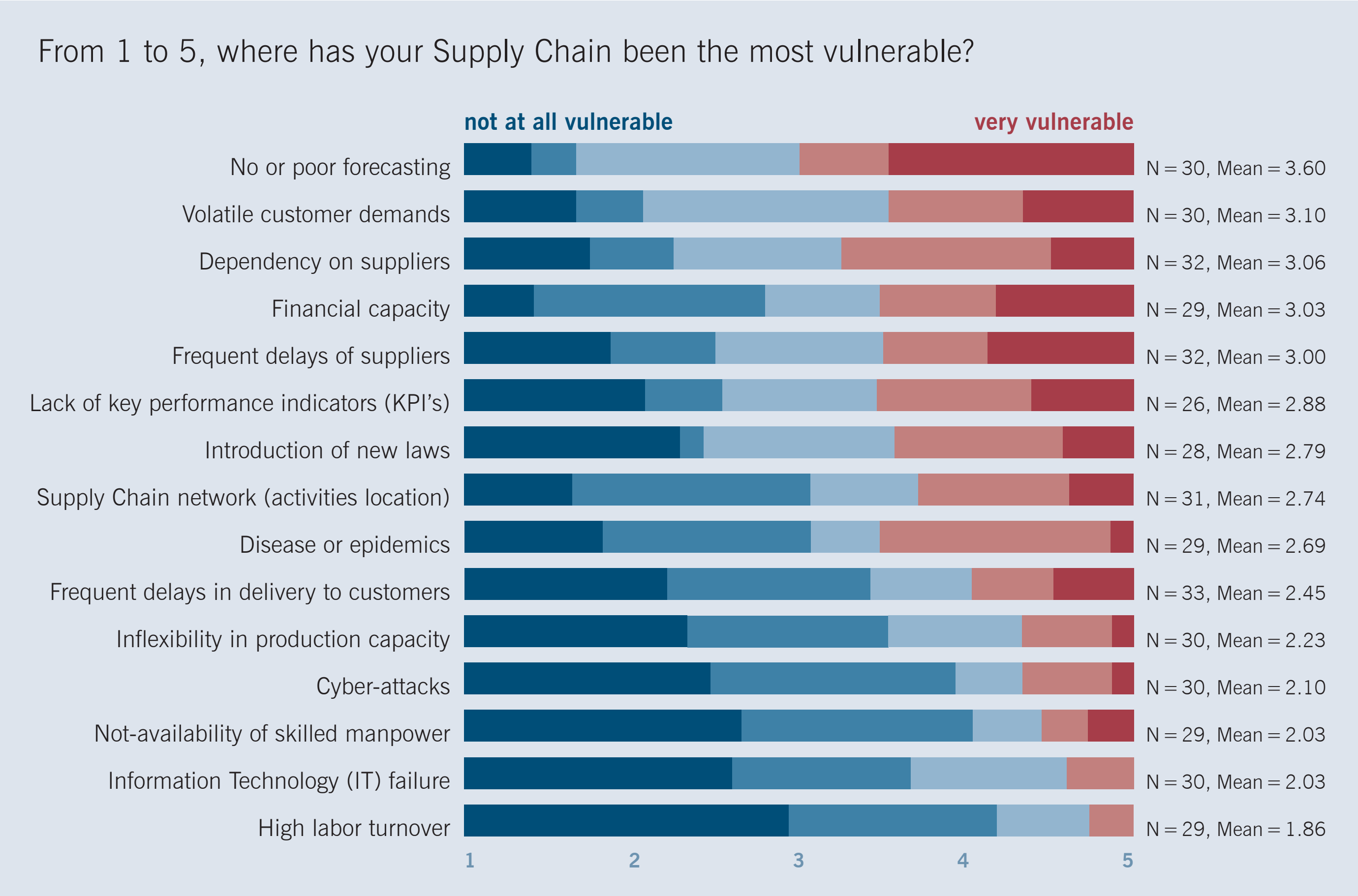

Figure 2: Vulnerabilities

measures that derive the most from the sanitary situation, 10 respondents reported using scenario planning, 8 had to implement an HR contingency plan, 7 sought to increase visibility on their supply chain activities and, finally, 6 announced that they had looked for alternative distribution channels.

How did participants rate the impact of these measures? To find out, the average of the effectiveness scores for each of the proposed measures was calculated and then the measures were ranked according to that score (Figure 3). The importance of collaboration among supply chain stakeholders clearly stands out from this ranking. For example, collaboration with suppliers ranked first in terms of the most effective measures (4.13 out of 5), the development of close collaboration with customers ranked third (3.9) and the development of close collaboration with logistics providers ranked fifth (3.89). Collaboration within the supply chain is therefore essential to overcome crisis. This point was also confirmed during the semi-structured interviews: *"we spoke with three key suppliers that we could not easily replace, to be informed of their perception of the situation and to find out whether they were able to deliver or not"* (Christian Spoerl, Managing Director at Idonus Sarl); *"from March to June, we held weekly meetings with our active suppliers to find out how they were managing the situation, and then we compiled the data obtained to send them to our partners' crisis managers"* (Christophe Pot, Director at Spontis SA). While most companies already had effective collaboration tools – such as VMI (Vendor Managed Inventory) – before the crisis, which allowed for better responsiveness, it was still necessary to further strengthen the relationship: *"when the crisis started, we approached our main customers and asked them for which products they could not afford a shortage, then we worked on these products in priority to guarantee supply, either through in-house production or through partnerships with subcontractors or suppliers"* (Vladmir Zennaro, CEO at Bergeon SA). In the online questionnaire, some respondents also called out the importance of multiple sourcing and the need to have suppliers located in different countries – or even continents – to avoid supply disruptions. Figure 3 shows that the two other most effective measures concern increasing supply chain visibility (3.95) and holding safety stocks (3.89). Visibility remains a major challenge for companies. While visibility is related to the desire for improved collaboration discussed above, holding safety stocks was the subject of many comments in the semistructured interviews. Most of the managers explained that they had built up stocks in anticipation of the aftermath of the crisis: *"if safety stocks already existed before, we asked our hazelnut supplier to increase its stock in order to bring in as many hazelnuts as possible before possible customs closures or quarantine of drivers"* (Benjamin Rindlisbacher, head of the sales backoffice at Camille Bloch); *"we have set up a procurement strategy called 'coronastock', for which we have injected several million Swiss francs in order*

To respond to the COVID-19 crisis, which of the following measures have supported your Supply Chain? Have these different measures been implemented before or during the sanitary crisis? From 1 to 5, how effective have these been?

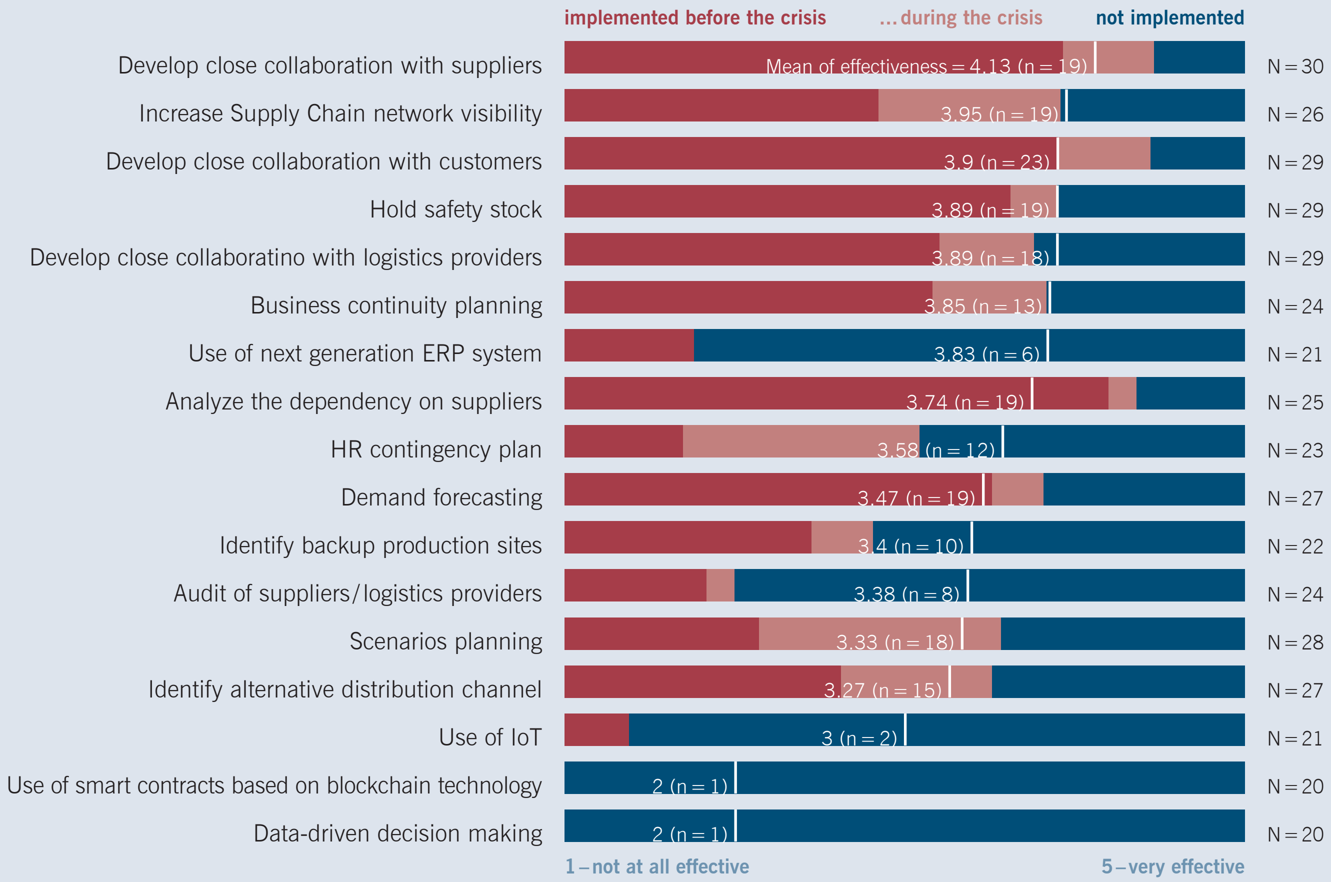

Figure 3: Measures taken

to increase the level of our stock. We talked with our suppliers and guaranteed them business until the end of 2020 and even 2021, which allowed us to secure our orders and build up our stocks. This was our best action during this period" (Christophe Pot, Director at Spontis SA); *"we modified our minimum stocks in order to raise them"* (Christian Spoerl, Managing Director at Idonus Sarl); *"we changed the minimum stock levels in our ERP system to strengthen strategic products and to lower other secondary products"* (Vladmir Zennaro, CEO at Bergeon SA). In addition, some participants in the online questionnaire pointed out that the crisis has demonstrated the advantage of sourcing within national borders. Shortening supply chains and ensuring proximity to suppliers therefore appears to be a timely strategy, which seems to echo the phenomenon of "slowbalisation" (The Economist, 2019). Finally, to conclude on the measures judged the most effective, it is interesting to note that if the new generation of ERPs have rarely been implemented (only 4 companies of the sample use such systems), they seem relatively effective to fight against the impacts of the crisis (3.83 out of 6 respondents).

Semi-structured interviews conducted following the online questionnaire revealed other good practices. Some companies were able to put into practice crisis management committees already imagined before the crisis. For example, these committees were tasked to analyze the Swiss Federal Council's directives and then make concrete proposals to management, who were able to take quick decisions: *"it's an effective measure: we know our skills, we know what to decide, we know in advance what to do. A protocol had even been drawn up to find out which products to prioritize in the event of a problem"* (Benjamin Rindlisbacher, Head of Sales Back Office at Camille Bloch). Other participants in the interviews saw the internalization of production as another good practice against the crisis: *"before, we were very dependent on our subcontracting network, whereas today we have taken everything possible in-house. This allows us to have an internalized supply chain with our own production workshop"* (Vladmir Zennaro, CEO at Bergeon SA). This company has even managed to adapt its business model at the height of the crisis: *"as we have been importing cleaning products for work surfaces for decades, we have privileged contacts with companies certified by the Chinese government. We have therefore had access to formalized products that can be exported from China. In a few weeks, we obtained half a million*

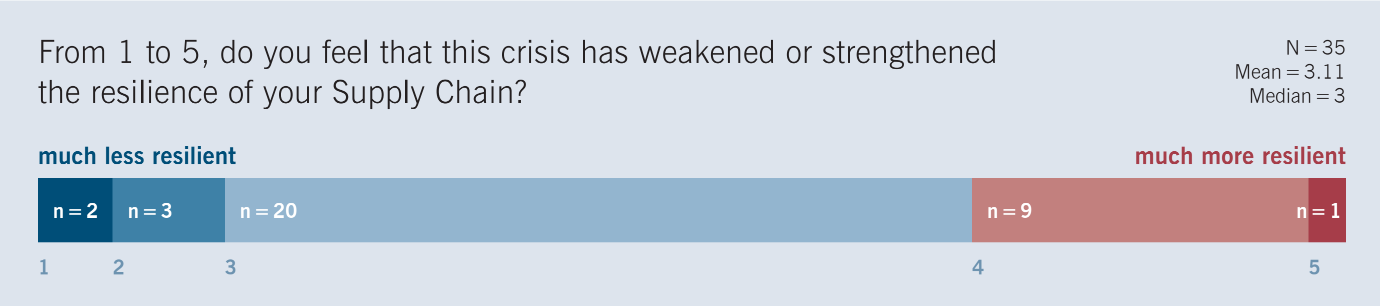

Figure 4: Supply Chain resilience

certified masks, which became a temporary business activity (but not our core business)" (Vladmir Zennaro, CEO at Bergeon SA). Finally, others saw the crisis as an opportunity to accelerate business diversification initiated a few years ago, but also as an opportunity to improve the company's online presence or to conduct marketing campaigns on social media, taking advantage of the fact that the population was confined at home (one participant mentions a higher response rate than usual).

Supply Chain resilience

Has the crisis strengthened companies' supply chain resilience? Figure 4 shows that while a trend towards increased supply chain resilience can be seen, it remains very moderate. On average, companies estimated the reinforcement of resilience at 3.11 on the Likert scale for the five scores proposed to them. Most respondents selected the median value of this scale (20 participants ticked 3), followed by a score of 4 (9 participants), then the 5 remaining responses were split between the other scores. It is interesting to point out that this question is the only one that significantly split the companies in the sample according to their size. Indeed, a statistical test (Kruskal-Wallisen) shows that the result for this question was lower for micro (less than 10 employees) and small companies (between 10 and 49 employees) than for medium-sized companies (between 50 and 249 employees). While the size of the sample suggests that this result should be viewed with caution, it might be interesting to try to understand the components of this difference. Was it the lack of human – and probably financial – resources that prevented the smaller firms from improving their supply chain resilience, or their organizational capacity to cope with disruptions due to their size?

To conclude this article, it is interesting to highlight the main lessons of the crisis and the evolution of the practices identified by the companies that responded to the online questionnaire. The answers varied greatly, but many of them mentioned "teleworking". For example, one participant indicated that *"while for the physical logistics, we have put in place a new, more flexible organization, the crisis has demonstrated that the administrative work can be carried out from home, which was not obvious a priori"*. While the importance of teleworking was cited several times, some participants mentioned the management difficulties that this arrangement could cause, internally, but also with suppliers, which were sometimes difficult to reach because they were in a reorganization phase. The second lesson is that responsive ness seems to be a determining factor in companies' resilience. Those that were able to reorganize quickly in terms of procurement, production and sales have indeed gone through the first phase of the crisis with less impact than others. Third lesson, undoubtedly the most frequently mentioned by the companies, the quality of the relationship with the supply chain' stakeholders appears to be of prime importance. As the crisis considerably increases the uncertainties on supply and on customers' orders, the reliability and adaptability of the partners proves to be essential to business continuity. Many of the companies have indicated that they have increased the number of exchanges in order to have the most relevant information, find solutions to the many challenges linked to the crisis, and avoid both the famous "bullwhip effect" and situations of over-dependency on certain stakeholders. This emphasis on communication and information research is sometimes accompanied by the implementation of an S&OP (Sales & Operations Planning) process based on new technologies or latest ERP tools. However, even when communication is optimal and the indicators efficient, companies still point out the unprecedented and therefore unpredictable nature of the current crisis.

To conclude, and as a response to the online questionnaire reminds us, this crisis will have demonstrated by experience that in an economy where supply chains are increasingly complex and fragmented, *"a flap of a butterfly's wing in China can set off a storm in Switzerland"*.

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