What strategies for subcontractors faced with a reconfigured value chain? The fine jewelry business in France

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Actions from players who are trying to dominate the process of value creation often punctuate the revamping of the value chain in an industry. But what about businesses in a much more subordinate position in the chain? What strategies guide how they reposition themselves in the market? The patterns whereby French subcontractors in the jewelry business have adapted are described. As changes in the luxury goods business are forcing them to raise questions about their position in this value chain, subcontractors must cope with a series of organizational and strategic tensions. As a function of their range of action, degree of autonomy, know-how and relations with their principals, four types of adaptation have been identified: safeguarding, specialization, cooperation and "coopetition". They evince a diversity of strategic options in situations where ideas might have become fixated.

The luxury goods business has, since the 1980s, been deeply restructured in line with the internationalization of supply and demand. The vector of this restructuring in France has been the emergence of big international groups (CHATRIOT 2007), whose brands tend to set the tone for business strategies in this branch of the economy (BASTIEN & KAPFERER 2012).[1]

However this trend in the fine arts and crafts toward a globalized, financiered business has spurred tensions (DEPEYRE & SERAIDARIAN 2015): the scarcity of resources, skills and know-how (BOUTON *et al*. 2015); changes in production that industrialize craftworkers' know-how (AGOGUÉ & NAINVILLE 2010); the access to short- and long-term funding; trends in the international supply of luxury goods; societal issues; etc. The momentum of growth is redesigning value chains: changes in the relations between brands and subcontractors; the delocalization of (some) activities; the disappearance or absorption of independent craftworkers; and the concentration of subcontractors. For example, in situations where craftworkers used to have a hold over the whole value chain, they now have to cooperate with other economic agents in order

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OVERLOOKED...

to have access to raw materials, design products appreciated by clients, gain admission to distribution networks in France and abroad, or take account of new environmental and societal requirements.

The changes in activities along value chains in the luxury goods business raise questions about the ability of economic agents to stake out positions in this new business-scape. Evidence of this is the appointment in 2011 of a strategic committee for the fashion and luxury goods industries under the Ministry of Industry in France (LEPERCHEY 2013). Studies conducted in other branches of the economy, such as automobiles or computers, have shed light on what is at stake in the branch's adaptation to trends in "*value dynamics*" (BALDWIN & CLARK 2000, JACOBIDES & TAE 2015, JACOBIDES *et al*. 2016). Faced with deep changes in their branch, businesses have several means of action, for example: develop a distinctive strategic position, guarantee quality, focus on "customer value" or create new opportunities for growth (JACOBIDES & MacDUFFIE 2013). However these means reflect the strategies of the players who are seeking to dominate and control value creation in the branch. What about the players who do not pursue objectives of this sort? They are not lacking in means (DONADA & DOSTALER 2005). But what criteria will guide them as they redefine their position on the value chain?

Herein, we shall inquire into the ways that French subcontractors in the fine jewelry business are adapting as their sector is being restructured owing, in particular, to the actions of the principals who pass orders for their services. After describing the organizational and strategic tensions arising in this context, we shall draw information from semidirective interviews in order to explore how these subcontractors have adapted. Four types of adaptation are identified as a function of a subcontractor's range of action, autonomy, know-how and relations with principals.

Value chains under tension

The trends reshaping value chains have spawned tensions at three interdependent levels: macroeconomic, interorganizational and intraorganizational. This overlapping of these levels, which we shall analyze, is typical of questions related to business strategies, since the latter require a focus, both broad and precise, on what is happening outside and inside the business organization.

A first series of issues has to do with the quality of the integration of agents in their economic, technological and social environment (the macroeconomic level), *i.e.*, with factors related to the "*evolutionary fit*" (HELFAT *et al*. 2007). For example, developments in new energy sources and environmental requirements are affecting the automobile industry's value chain. As for the luxury goods business, in particular fine jewelry, the globalization of supply and demand since the 1980s has had an impact on it. While the growth of international demand opens opportunities, it also requires many an adaptation to cope with demand cycles in different countries, to ensure a quality supply of raw materials or to maintain a distinctive value on a globalized market. Growing markets also necessitate knowing how to accomplish the work of craftsmanship on a larger scale. To respond to these issues, big groups have formed in the luxury goods business. For subcontractors of a smaller size however, dealing with this globalized environment is a factor that, as it destabilizes their activities and capacities, forces them to restructure.

A second set of issues has to do with how activities are distributed among economic agents on the value chain, in other words both between the principals who pass orders and their subcontractors and between subcontractors themselves (the interorganizational level). The value chain is being reworked through the relations established between the many parties who enter into the individual and global (*i.e.*, at the chain level) creation of value. These relations take various forms. They might be purely transactional or might be cooperative (HEIDE & JOHN 1990); and they might vary as a function of the power wielded by agents in the chain (DONADA & NOGATCHEWSKY 2008).

During the 1990s, the computer industry's value chain disintegrated as players such as Microsoft and Intel emerged to the detriment of the overarching IBM. This disintegration led to more cooperation between players but under the domination of those who controlled key components, such as operating systems or microprocessors (GROVE 1996).

Table 1: The value chain in the jewelry business in France	
The agents (subcontractors)	The number of jewelry-makers is decreasing, but production has held steady. — The number of jewelry-makers in France decreased by 43.6% between 1995 and 2015: from 4719 to 2662. — The personnel in the jewelry business fell by 54.1% during the same period: from 17,813 to 8,184 employees. — However sales (excluding taxes) were much less affected (-9.2%), decreasing from €1885 to €1712 million. *Source*: Comité Francéclat, February 2016.
The principals	The main brands in the jewelry business are: — independent jewelry businesses: Cartier (Richemont since 1993), Fred (LVMH 1995), Chaumet (LVMH 1999), Van Cleef & Arpels (Richemont 1999), Boucheron (PPR 2000), Bulgari (LVMH 2011) and Pomellato (Kering 2013). — jewelry houses incorporated in groups with several brands: Dinh Van, Joël Arthur Rosenthal, Mauboussin, Mellerio, Poiray. — luxury goods businesses that have diversified into the jewelry trade: Hermès (1927 for jewelry), Chanel (1993), Dior (1999), Louis Vuitton (2004)

In the jewelry business, the principals are the historical jewelry houses (either independent or part of a group with several brands) and luxury good businesses that have diversified by moving into the jewelry trade (*cf.* Table 1). These principals heavily rely on networks of subcontractors, in particular for low- and mid-market jewelry and, too, for exceptional collections. They increasingly concentrate on design and distribution, and outsource production while exercising strong power over relations with subcontractors: "*lordship*" in Donada and Nogatchewsky's typology (2008). To keep control over their brands, they limit the number of licences they grant. To meet the principal's requirements with respect to quality and flexibility in a context where the number of jewelry-makers in France is decreasing, subcontractors have had to adapt their relations, whether of competition or of horizontal and vertical cooperation.

A third set of issues has to do with the capacity of these firms for maintaining and improving know-how (the intraorganizational level). This raises question about their "internal" coherence or "*technical fit*" (HELFAT *et al*. 2007). The restructuring of value chains might push a firm toward new fields of expertise or, on the contrary, eventually strip it of expertise. Managers need information in real time about the capacities not only of their own organization but also of their partners'.

In luxury goods, especially in fine jewelry, questions have also arisen about innovation: how to redesign business activities so as to take advantage of, for example, the possibilities offered by new techniques (such as 3D-printing)? The question also crops up about maintaining existing know-how — a major stake given the risk of a shortage of certain qualifications. The principal labor pool in this economic sector is located in Paris, Franche-Comté and the area around Lyon.

Methodology

This analysis of the place of subcontractors in the fine jewelry business in France focuses on the three aforementioned levels: macroeconomic, interorganizational and intraorganizational. What organizational and strategic tensions have arisen there as the fine jewelry value chain is being restructured? What levers of action are available?

The choice of this topic was a matter of "*methodic opportunism*" (GIRIN 1989), following a study in 2013 for the Ministry of the Economic Recovery that sought to detect, list and map know-how in the fashion and luxury goods businesses (SERAIDARIAN & MASSA 2014).

The current study is grounded on interviews that, conducted with professionals in the jewelry business, sought to identify current problems and propose actions for the government and local authorities. We have, herein, concentrated on one of the eight sectors previously studied, namely fine jewelry, in order to examine current controversies in a single context (YIN 2009). In the jewelry sector, we could gather a range of interpretations and reactions from subcontractors.

Table 2
List of interviews: Type of organization and position of the interviewee

Specialized subcontractors	ST5: Director ST6: Director
Generalist subcontractors	ST1: Director ST2: Director ST3: Director ST4: Director ST7: Sales/marketing director
The principals	DO1: Senior head of products jewelry/clocks/watches DO2: General manager
Trade organizations	FP1: President

Table 2 lists the ten semidirective interviews we conducted. The guidelines for these interviews provided for openly broaching issues related to this ecosystem (trade organizations, standards, laws, networks and the appreciation of know-how and qualifications), its strategies (positioning, financing, development, innovation) and organizations (the operation of workshops, initial and ongoing training, learning, recruitment, transfers of ownership) — all this in relation to the three aforementioned levels. All interviews were transcribed (a total of 87 pages) except for three that had not been taped but had been summarized in a report (nine pages). Data collection focused on the subcontractors, but this information was completed thanks to interviews in the jewelry business that helped us better understand the context.

The data were analyzed in three phases.

● From the interviews and complementary sources, we gleaned information about how the jewelry business operates, and were able to map the main activities, skills and qualifications put to use on the value chain (cf. Figure 1). We thus distinguished two profiles of subcontractors: those specialized at a precise link in the chain (such as carving or stonesetting, ST5 and ST6 in Table 2) and those with a more general activity as subcontractor for a principal (ST1, ST2, ST3, ST4 and ST7): in other words, profiles as specialist or as generalist.

● During a second phase, we related information from the interviews to the three levels (macroeconomic, interogranizational and intraorganisational) and thus improved our understanding of the issues. The next section of this article provides an account of this. We paid close attention to: the interdependence between levels, the convergence and diversity of viewpoints, and the comparisons sometimes made with other players in the luxury market and beyond.

Aperçu des acteurs.

Sous-traitants	Les fabricants sont de moins en moins nombreux, mais la production se maintient : ● Le nombre de fabricants en bijouterie-joaillerie a diminué de 43,6 % entre 1995 et 2015, passant de 4 719 à 2 662 sur le territoire français. ● Les effectifs ont également diminué de 54,1 % sur la même période, passant ainsi de 17 813 à 8 184 employés. ● Mais le chiffre d'affaires de la production hors taxes s'est presque maintenu (-9,2 %), passant de 1 885 à 1 712 millions d'euros. *(source : Comité Francéclat, février 2016)*
Donneurs d'ordres	Les principales marques de joaillerie sont associées à : ● des maisons joaillières indépendantes : Cartier (au sein de Richemont, depuis 1993), Fred (LVMH, 1995), Chaumet (LVMH, 1999), Van Cleef & Arpels (Richemont, 1999), Boucheron (PPR, 2000), Bulgari (LVMH, 2011), Pomellato (Kering, 2013), ● des maisons joaillières intégrées à des groupes multimarques : Dinh Van, Joël Arthur Rosenthal, Mauboussin, Mellerio, Poiray, ● des maisons de luxe s'étant diversifiées dans la joaillerie : Hermès (1927 pour la joaillerie), Chanel (1993), Dior (1999) et Louis Vuitton (2004).

Les maillons de la chaîne de valeur.

Les principales ACTIVITÉS	TRANSFORMATION			CONCEPTION		PRODUCTION		DISTRIBUTION	
	Transformation / achat de métaux	Achat / négoce de pierres	Taille de pierres (lapidaires, diamantaires)	Création	Prototypage	Fabrication	Sertissage	Polissage	Vente B2B B2C
Les CAPACITÉS mobilisées	• Maîtriser la technique de fonte • Anticiper les besoins • Acheter du métal haute qualité au meilleur coût	• Choisir des pierres de qualité, uniformes • Maintenir le stock • S'approvisionner malgré la rareté	• Maintenir la taille de la pierre pour un parfait ajustement à la monture	• Créer des collections identitaires	• Interpréter le dessin et le traduire en volume • Intégrer la CAO	• Produire des pièces parfaites • Intégrer les nouvelles technologies	• Réaliser des sertissages de très haute précision • Maîtriser plusieurs procédés de sertissage	• Apporter un poli de qualité, une parfaite mise en valeur de la pierre	Distribuer les pièces dans un envrionnement identitaire
Les TENDANCES dans la chaîne de valeur	Activité souvent externalisée (vers des spécialistes)	Transfert croissant vers les donneurs d'ordres	Activité souvent externalisée (vers des spécialistes)	Le cœur d'activité des donneurs d'ordres	Activité souvent externalisée (vers des généralistes)	Activité souvent externalisée (vers des généralistes)	Activité souvent externalisée (vers des spécialistes)	Activité souvent externalisée (vers des généralistes)	Importance croissante des marques pour les consommateurs

Figure 1: Links in the value chain of the French jewelry business

● The comparative analysis of the data in relation to the three levels brought to light salient dimensions in subcontractors' organizational and strategic choices: their range of action, autonomy, know-how and relations with principals. In the next-to-last part of this article, we shall discuss four types of adaptation in line with the decisions that subcontractors make regarding these dimensions as they try to reposition themselves in the value chain.

Since certain questions were sensitive, we have reformulated the cases discussed during interviews to ensure anonymity, except for information in the public domain.

Subcontractors in the French jewelry business

A business operating in an international market

The need to manage cyclical demand

The jewelry business is used to market cycles in pace with international demand. When demand slackens, subcontractors try to maintain a minimal level of activity in order to financially "pull through", keep craftworkers and preserve know-how. Under these circumstances, support from a principal, whose business is often more diversified, can prove essential; and vice-versa, the absence of support can be a source of difficulties. A subcontractor (ST5) commented on a principal: "*They don't have an overall view. They are the least supportive in the business. When there was the slump, for one and a half years, no one heard from them! That wasn't the case of others jewelers, even [in the same group], who continued working with subcontractors. It was terrible, when they said, 'Stop everything!'… a year and a half, nothing… That's suicidal!*" The last downturn, in 2009, seems to have hit the jewelry business hard, but the recovery marked the start of a new cycle. Whereas the growing demand from Japanese consumers fueled the market in the 1980s, other Asian countries (in particular, China) now spurred the rebound.

Maintaining activity is important to preserve know-how, since it takes years for craftworkers to learn the trade: "*It takes seven years of training for a lapidary to become autonomous… if not more! This know-how, when demand drops, we're clobbered. That happened for a few years. Now, things have picked up: the brands are asking for us, in all countries in Asia. Fortunately they're there, otherwise, we wouldn't have the business we have*" (ST5). We shall return to this issue of training and know-how.

Another factor of instability is the supply of raw materials (metals, gemstones, diamonds). Strong market growth brings, in addition to price swings, the problem of the ever shorter supply of these materials, which are "*nearly inaccessible, because everything is bought up. All the sales representatives who go to Hong Kong to buy materials there [… when a] Chinese client comes in with his wad [of money], and he puts it on the table and says, 'I take that!', well, we have to take what's left*" (ST1). A principal (DO1) voiced his concern: "*The time's coming when there'll not be any more stones, and then, that's going to be a problem… a shortage of [raw] materials, because not enough diamonds come out of the mines, there are more and more controls. The shortage not of people but of materials is what scares me!*"

Subcontractors and principals bear the brunt of trends in final demand, French and foreign, and in the demand for raw materials. The purchase of raw materials has gradually been shifted onto the principals, whose finances are better suited for handling the growing costs of these materials and the volatility of their prices (in particular gold, which cannot be bought forward, not even for professional uses).(2)

Another solution has been to reduce stocks, all along the value chain (for example, imitation jewelry in showcases), and to make changes in design even if the resulting product quality is questionable: "*The cost of raw materials has increased fourfold, and wages aren't rising. So, some distributors have lowered the number of carats. We've gone from eighteen to nine carats, and it's clearly another product with only 35% gold. Distribution is absolutely not clear about this […] We're no longer talking about the same thing, and the product no longer lasts as long*" (ST3).

(2) Between 2000 and 2011, the price of gold increased sixfold, and has stayed high (XERFI report, Luxury Companies-World, July 2013).

Problems related to security also come into play for producers, distributers and consumers.

Reactions to international competition

The evolving international environment has implications for competition. First of all, traditional competition within Europe, specifically Italy. Italian subcontractors have formed groups and now have a solid network of retailers who distribute their products. Their business, more balanced, has grown; and they can compete in terms of costs. The positions they have staked out tend to be on the market of jewelry [*bijouterie*] made with precious metals rather than the market of fine jewelry [*joaillerie*] made with gemstones. Their working of metals is of high quality, but their ability to work gemstones is less impressive.

As in many other branches of the economy, competition has sharpened owing to the upsurge of competitors in Asia, especially China and India. Subcontractors have had to compete for batch productions, typically in the accessory lines of fine jewelry houses.

Even though this competition exists and has an impact, as pointed out, on the markets for raw materials, it is still limited, and the terms of competition are sometimes reversed. In effect, a principal and his subcontractors have to constantly, over a period of several months, meet each other for clarification, even once they have agreed upon the series to be produced. Constant controls have to be carried out to make sure that quality does not decline as pieces are delivered. For this reason, the gain in the initial cost resulting from a large volume of production soon evaporates. "*I think the principals, between five and ten years ago, all experimented with what was happening in Asia. They went there to see, they even had things made there, but realized that working with Asia was complicated […]. It was not adapted given the distance and the size of the series. Not to mention that their taste is different from ours […]. A piece of jewelry has to be beautiful, with standards of beauty that are, in every case, highly subjective*" (ST2).

Subcontractors in France might profit from international competition by producing for new, foreign principals, whom the quality and renown of the French jewelry trade attract. Here too, there is a high risk of a transfer of knowledge or skills.

Despite lively international competition, which was often mentioned during interviews, it acts like a "*legend*" (ST2) that spurs a reaction but does not amount to much of a threat. The know-how in this trade and the network of jewelry stores in France form protective barriers for businesses in this sector.

The key problem is how to turn distinction into value: "*What saves us is our proximity: we're reactive, and we count on our discretion and sense of confidentiality […] When certain models or specifications for settings were sent abroad […], they were soon copied. But the problem is the value that people are ready to pay for our work*" (ST5).

In 2006, the UFBJOP, a trade association (Union Française de la Bijouterie, Joaillerie, Orfèvrerie, des Pierres et des Perles) created the label of origin "Joaillerie de France" to certify that the products with this stamp have been made in France while respecting the rules of the art and adhering to the legal, social, ethical and environmental rules and standards about the activities of firms in this sector in France. This label attests that the jewelry has been made, set and polished in France.

Although the worth of this label for French businesses seemed evident, the decision to introduce it set off a debate. One point under discussion while the label was being drafted had to do with what was to be certified: products, or workshops and firms? The decision was made to label the products, but attention has been drawn to the abusive use of the label (by jewelry-makers who place it on their stationery) even though only some of the brand's products have the label. Another problem is engraving the hallmark, which is often too big for the jewelry. In response, the UFBJOP has tried to use laser engraving for certification, but this requires modifying the law and obtaining validation by EU authorities, actions that have taken time.

Above all, the big jewelry brands have not fully backed this approach to certification. Not only would this process expose some of their products for not being made in France, but also their reputation is solid enough that they do not necessarily need the label and have no interest in adhering to it: "*I think this idea's morally praiseworthy, but we haven't managed to sell it to our principals, to jewelry businesses […] On Vendôme, you have jewelry made everywhere in the world: they don't necessarily know where. When you go to buy a three gold ring from Cartier, you're buying a three gold ring from Cartier, whether made here or there! You don't ask yourself the question. The brand's the guarantee of know-how and quality*" (ST3). The stakes differ depending on the business.

This leads to the issues related to the distribution of activities along the value chain and, consequently, the relations (and tensions) among players on the chain.

The distribution of activities along the value chain

The dominance of brand names

As mentioned in the introduction, the growth of the luxury goods market has been pulled by the development of big groups and of brand names within these groups. The fine jewelry business is no exception. Although unbranded jewelry is prevalent in the general jewelry market, the tone in the fine jewelry market is set by the brands that organize this business: "*Marketing now dictates to the world [what it has to do] to develop collections. We just put up with it: we're no longer in creation, even in the finest jewelry, except when the jewelry involves gemstones [… We] increasingly have to 'wait for the order' before buying*" (ST5).

Principals tend to specialize in the activities of design, distribution and, as mentioned previously, procurement. These are the core activities of the brands, while the actual making of jewelry is easily subcontracted (*cf.* Figure 1). When creative activities are externalized (as sometimes happens), the goal is to stimulate in-house creation instead of definitively outsourcing creation itself.

Retaining in-house part of the process of jewelry-making is done for very specific reasons. It might be done to preserve a distinctive know-how closely linked to the brand. Some principals have their own workshops for the sake of prestige. These workshops (sometimes recent) often turn out to be unprofitable; but the purpose is to sustain the brand's identity and to tend relations with the most important customers. Chanel, for instance, opened a fine jewelry workshop in December 2012 for prototypes, fineries and special orders; but it also continued working with several subcontractors in Paris. Louis Vuitton had done the same six months earlier.

The distinction of its brands on the value chain does not spare the firm the effort of re-evaluating the brand's value. For example, some "confidential" jewelry houses are counting on a restoration of the prestige of "creations" and of jobs related to creation: "*At some point, the brands became so important vis-à-vis customers that there was indigestion, and people want to come back to what is authentic, to the historical brand names that have something to say and, above all, that bear new, real creations. Even though the effort was made to more or less keep the brands as small or middle-sized businesses (inside groups), they have often been petrified owing to their size*" (DO2). Other businesses are seeking to link their brands to know-how and expertise by acquiring small workshops: "*We're busy on the arts and crafts, which were dying out ten years ago but are now coming back to life thanks to fine jewelry or fashion houses […] The real value nowadays is this heritage, all these jobs in the fine arts and crafts that are vanishing. It's not the Internet; this is French know-how, the master craftsman*" (DO1).

Nonetheless, the balance of power still tips toward principals.

Vertical partnerships under pressure

Some subcontractors pointed to the long-term effects of the disappearance of workshop activities centered on creation: "*In my opinion, it's an enormous loss for the business, and the brands aren't aware of it! Once we're practically nothing more than fitters, everything that makes our DNA as technical creators will have vanished*" (ST4).

Above all, the requirement for quality in the making of fine jewelry has not been dropped. Instead, added onto it are requirements related to costs and deadlines: "*It's not because I'm the only one to do work of this quality when setting stones that they pay me a great deal*" (ST6).

Contacts with subcontractors tend to be passed by the principal's procurement services and no longer by the brand director. To explain this, interviewees recurrently referred to the automobile industry: "*Don't forget: we're a very small professional group but in a profession that's evolving, especially in its relations with the principals who pass orders, toward what the automobile industry is or is becoming. In other words, the principal is powerful. He's the one who brands, who sets the tone. It falls on subcontractors to move, to be in tune with the principal's instructions. The proof is that the persons who are our contacts in the big houses come from aviation or agribusiness… So for* *six months, they don't understand anything; but then, since they're smart, they come to understand after six months. What's happening in the automobile industry is not fully duplicable, but some of it is… So we're starting to be audited, to have a charter. That's something new for the profession*" (ST3).

Several subcontractors admitted that the changes demanded, though not pleasant, might make sense. Interviewees emphasized, however, the excessive pressure they were under: "*We heard at a meeting: 'If I have a workshop that turns at 70% for me and that, one year, has sales of three million euros with 6% profits and that, the next years, has sales of six million with 8% profits, well now that's thanks to me! So the difference between 6% and 8%, I think it should be shared.' Now, I'm not a major economist, but for me, that's called a kickback; and to the best of my knowledge, kickbacks aren't authorized*" (ST4). Later on, we shall see how "nonproductive" knowledge is evolving in line with the changes already made in the businesses of the principals.

There was also talk about an outsourcing directly related to production capacity (different from the outsourcing of "secondary" activities). This outsourcing is intended to cope with the rising tempo of work when demand peaks or, on the contrary, to amortize slack periods. As we have seen, all players along the value chain, whether principals or subcontractors, face the cyclical nature of demand; and this form of outsourcing is a logical response to this situation. Furthermore, subcontractors also externalize production work toward second-rank subcontractors. Interviewees said that a lack of solidarity among parties on the value chain might eventually harm the sector as a whole.

Accusations were not made against all principals, and many subcontractors admitted the need to restructure workshops and the sector. However this admission was often made for the purpose of adjusting the balance of power and obtaining more clout during negotiations.

Room for maneuvering?

The subcontractors interviewed mentioned several possibilities.

One is internal: a subcontractor develops his own production in order to sustain the activity of creation and to profit directly from spurts in demand. Although several workshops have done this in the past, this possibility brings problems. One is competition with the collections distributed by the workshop's principals. If this solution is well thought out however (with, for example, a legal and physical separation between the two lines of jewelry and a clear differentiation of the identities of the two collections), tensions can be lessened: "*I think that principals are intelligent and are capable of making allowances. I don't think they'll criticize a shop for developing its own collection. Besides, a shop that both works for a brand name and develops its own collection is going, above all, to do everything necessary to make sure that it does not make products that resemble what it has made for the brand*" (ST2). In fact, the major drawbacks are related to the means needed to develop a line of jewelry, keep it up to date, finance the costs of selling the jewelry, gain admission to a distribution network, keep stocks, etc. — a whole new business. Even though several subcontractors discussed this possibility during interviews, only one of them now has his own collection. To make it, he followed a clear strategy for a "*professional brand at point of sale*" (ST3) that draws attention to the technical characteristics of the jewelry (*e.g.*, the quality of the metal) but with a legal and physical separation of his activities.

A second approach, more often taken, is external, involving buyouts and partnerships. Some workshops have accepted to be bought out by their principals, this often being a way to safeguard their activity thanks to a more favorable cost structure and more secure outlets. As for the principals, their objectives are not always the same. Sometimes, they want to preserve a menaced know-how by integrating the workshop in their own business, even though the shop still enjoys a degree of autonomy and continues taking on jobs for several brands. There is, too, a trend toward concentrations among workshops with the goal of reaching a critical size and rebalancing relations with principals. The example of the automobile industry was, once again, often mentioned: "*Subcontractors in the automobile industry have all vanished, except those capable of forming a group, which has become Valeo. If jewelry subcontractors are not capable of creating the Valeo of jewelry, they are going to sink. It's hard, but that's the way it is*" (ST4).

Some plans for grouping subcontractors take the form of cooperation, without a buyout, so as to pool certain assets: a joint location of workshops to facilitate business relations and better manage security (insurance costs), or a joint location for a point of sale with a quality of service on par with customers' expectations. However such plans are hard to realize. Cooperation between subcontractors is not always welcomed: "*It's what principals want, and the National Federation has headed in this direction by emphasizing security problems or rules and standards, since the workshops are in residential buildings. But it's necessary to maintain diversity; [otherwise] we'd be even more at the mercy of the brands*" (ST5).

Several subcontractors complained about the workshops' "*individualistic culture*" (ST4). But is that specific to the fine jewelry business? "*Frankly, I don't know many sectors where there's sincere collaboration among businesses in the same sector*" (ST2).

Know-how and skills

Other issues arise at the intraorganizational or even individual levels.

Maintaining and fostering technical know-how

At the core of jewelry-making skills are a variety of techniques and the increasing use of high technology to assist manual tasks: computer-aided design (CAD), laser engraving and 3D-printing for prototypes.

Although processes are becoming semi-industrial in order to produce series, it is still craftworkers, who, aided by technology, make the jewelry. Some pieces require hundreds of hours of work. According to a workshop director: "*When people not from the business visit the workshop […] the first thing they say, with astonishment, is: 'But… everything's handmade!' The collective subconscious imagines, I think, a machine where you press a button and a piece of jewelry comes out the other end*" (ST2). A master craftsman (*maître d'art*) also insisted on assistance from technology: "*You scan the stone, you work on a computer file, and parts are made by hand [or rather] finished by hand. […] This made us advance a lot in the quality of jewelry-making. It's been done in association with old techniques, but all the workshops still operating are the ones that were able to invest and learn — make their personnel learn*" (ST1). Craftworkers make very precise gestures and are able to imagine the piece of jewelry they are working on and adjust their tools. Some are polyvalent, while others concentrate on very specific techniques in demand (in particular for carving, polishing and setting stones).

Several problems arise about how to preserve and foster this know-how.

A first problem: employees' initial training. Although training institutes have included the new technology in the curriculum, they offer few hours of practical coursework (even fewer and fewer), whence the need to supplement on the job the initial training of newcomers to the profession via contacts with confirmed craftworkers. This represents an investment for craftworkers and instructors. Besides, the training might last several years.

A second problem stems from the cyclical nature of the jewelry business. During market slumps, a sharp drop in a workshop's activities can push craftworkers, whose training took time, to leave: "*Business has to be a little brisk to integrate young workers and train them. From 2003 to 2008, we were able to hire and train young people, but were unable to keep them, so all that work fell through*" (ST3). Support, if possible, from principals can help some workshops smooth business cycles and keep qualified workers. Later on, during a period of growth, there will then be sufficient manpower to handle orders. A specialized subcontractor went so far as to say: "*My job is to refuse work, all the time, since I don't have the qualified personnel for meeting demand*" (ST6). Subcontractors and principals chase after available craftworkers by upping the ante in wages. For certain jobs however, this ante no longer counts in case of a severe shortage. The skills of carving, polishing and setting gemstones are in short supply on the labor market. Actions have been suggested for making jobs in the jewelry business more attractive.

Another problem has to do with changes in know-how and qualifications. The development of CAD, along with the recognition of the related skills in production engineering, implies reassessing careers: "*Nowadays, the best in CAD for jewelry are the people who come from the [traditional] jewelry trade. They were excellent at jewelry and […] become excellent programmers. What's more, they've worked out the best techniques for knowing how to do it with CAD. As for what comes out of CAD, you don't need the most experienced hands; you need level 2 or 3, not level 4. But the more we move toward making pieces using CAD, the less we'll be training level-4 people, since there's less of a need. So, in ten years, […] will there be enough level-4's? […] It's a vicious circle, and a lot of people don't realize it. We have to keep open the possibility of moving up to the highest level. […] The machine puts out what is put into it. I don't mean that anyone coming from computers is incapable of moving to jewelry, but it's a genuine advantage to have been a fine jewelry-maker, since some mistakes will not be made. We'll have lost a lot, especially the handmade know-how*" (ST4).

Introducing new technology, such as 3D-printers, also calls for sizeable financial investments (for machines and training programs) — a drawback for companies already strapped for cash. This brings us to a second sort of know-how, one directly related to managerial activities.

The growing importance of "nonproductive" know-how

Several interviewees said this sort of know-how was not very intuitive for craftworkers. According to the master craftsman: "*There's no time card, it's not well organized… The atmosphere's a little rock 'n roll in the workshop, pleasant but detrimental to productivity. A short while ago, I set up a time clock as a control*" (ST1). Several family and individual businesses that make fine jewelry "*have always operated without asking too many questions*" (ST3).

Several problems of a managerial sort have emerged.

One, already mentioned, is to manage cash flow in a cyclical business. The need for cash is important since subcontractors work very little, or not at all, with payments on account because it is too hard to make reliable cost estimates for pieces of fine jewelry.

The development of integral service packs for customs is making it easier for exporting businesses. The introduction of certifications, such as RJC (Responsible Jewellery Council), is also leading to more accurate specifications.

However the most important change concerns the rationalization of processes all along the value chain — a reflection of the changes that principals have already experienced in their businesses and would like to introduce when outsourcing to subcontractors. This trend is closely linked to the previously mentioned changes in the relations between these two parties and to strategic shifts in reaction (buy-outs, cooperation). Restructuring, though far from complete, gradually seems to be acquiring legitimacy: "*I think that, if the Parisian workshops do not make a clear move toward becoming more professional, there's a risk that jewelry-making will be moved to Italy, or somewhere else in Europe. [This calls for] being more reactive, being organized, having the staff, having a middle management (which does not exist today), being capable of training people fast, of designing a process and methods. That's it! In other words, you now have to accomplish the craftworker's gestures in a semi-industrial context: that's what's being demanded of us*" (ST2). A subcontractor insisted on the learning process: "*What is very positive is that the profession has undeniably become aware of what it used to be and of what it is and of what it has to become. That's fully recognized, and that's positive. Now, do all firms have the means to restructure, to match deeds with words? That's a different story […] We're in-between 'I don't know really how to to do it' and 'I don't necessarily have the means for doing it'*" (ST3).

An additional problem: Transferring ownership

Interviewees often mentioned another aspect of managerial know-how: the transfer of ownership of the business. This question cropped up mostly among subcontractors or the aforementioned "confidential" principals. One principal explained, "*With each generation, there's always the temptation of those what want to sell and those who want to stay. The continuity of a business is a choice, a combat, a conviction that the whole family has to share. But in a family, you always have forces, sensitivities, that are different… A majority has to form, and it's often a time of fragility, since business models have to be reinvented by each generation*" (DO2).

Three risks exist:

- The first is financial. Since subcontractors have low margins, which do not provide leverage, they do not much attract investors. It might be necessary for a public fund, such as the Caisse des Dépôts et Consignations (Patrimoine et Création), to intervene.
- The second risk is linked to the need to find a new owner with an appropriate profile, in particular when ownership is not being transferred to someone in the "natural" family. As already pointed out, jewelers are, above all, craftworkers; and they do not always have the qualifications needed to take over a workshop, or they do not want to.
- The third risk is the value of the workshop to be transferred. This value very much depends on the know-how of the shop's craftworkers, who might decide to change jobs when the ownership is transferred.

Four types of adaptation by subcontractors

Our interviews in the fine jewelry trade in France have shed light on the issues, already discussed, related to: the integration of this business in a globalized context, the organization of activities among various players and their relations with each other, and the know-how to be preserved and fostered. To cope with these issues, several organizational and strategic choices have to be made with regard to:

- the RANGE OF ACTION, vertically and horizontally, in the value chain. Some subcontractors remain specialized on a definite link in this chain or a market segment (*e.g.*, an independent craftworker who sets gemstones or a workshop that makes luxury jewelry), whereas others have a larger range of activity (*e.g.*, control over a full process in jewelry-making that might even extend to developing a brand).
- the DEGREE OF AUTONOMY. Some subcontractors have accepted to lose autonomy, as their activities are integrated in the production chain of a brand, whereas others remain independent. Autonomy can also be measured horizontally in terms of cooperation with other subcontractors.
- transactional vs. cooperative RELATIONS WITH PRINCIPALS. Some subcontractors have very competitive relations with their principals, whereas others prefer cooperation (in the form of "exclusivities" or by restructuring their activities to match the principal's demands).
- maintaining and fostering KNOW-HOW. The need to control know-how varies depending on the position sought in the value chain.

These choices, when made in coherence with each other, serve to identify four types of adaptation (*cf.* Table 3). Are certain types more relevant than others? It is not easy to directly compare the effects of each type; but two points are worth emphasizing.

Table 3:
How have subcontractors adapted?

	Type 1: *PROTECTION/ Safeguarding*	*Type 2:* *SPECIALIZATION*	*Type 3:* *COOPERATION*	*Type 4:* *COOPETITION*
Range of action	Targeted: the subcontractor is specialized and integrated in the principal's value chain	Targeted: the subcontractor is specialized on a link in the value chain (*e.g.*, setting gems)	Extended but without a brand: a generalist subcontractor with horizontal cooperation	Extended but with a brand: a generalist subcontractor integrated vertically
Degree of autonomy	Little autonomy: integration in the principal's business	Very autonomous: independence of the business	Very autonomous but horizontal cooperation	Very autonomous: independence of the business
Relations with principals	Close (exclusive or privileged) cooperation	Transactional	Professionalized cooperation in line with trends in the principal's business	Cooperation, organized to provide room for coopetition
Know-how and qualifications	Maintain and develop know-how and craftsmanship	Maintain and develop know-how and craftsmanship	Maintain and develop a semi-industrial know-how	Maintain and develop know-how all along the value chain, from design to sales

For one thing, the choice made must be internally coherent. Let us say, for example, that a subcontractor opts for "coopetition". He will then have to pursue a strategy for both developing his own brand and handling the orders he receives as a subcontractor. He must, therefore, be sure to control all the know-how needed for this strategy. In addition, he must tactfully handle relations with his principals. In other words, he has to manage relations both of competition (horizontal) and of cooperation (vertical) (DEPEYRE *et al*. 2018, JACOLIN 2016). During interviews, several subcontractors said outright that they had not chosen coopetition, since they preferred concentrating on solutions more in line with their capacities.

For another thing, one type of adaptation is not inherently better than the others. A type turns out to be more or less appropriate depending on the subcontractor's strategy and the time of deployment. Depending on his history and the context at the time, a subcontractor does not dispose of all four methods of adaptations. Bear in mind, too, that risk-taking differs depending on the type.

The narrower range of action of types 1 and 2 (protection/safeguarding and specialization) has a strategic risk. The narrow range of targeted action might restrict possibilities…

Type 3, which gives priority to horizontal cooperation (with others subcontractors via cooperation or buy-outs) carries an operational risk. Will the subcontractor be capable of realizing the expected synergy and using the expected advantages to solidify his position in dealings with principals but without losing his distinctiveness?

For type 4, the risk tends to be commercial and to arise toward the end of the value chain. Will the subcontractor be capable of reaching out to consumers without jeopardizing business relations with his principals?

Conclusion

Among the distinctive characteristics of jewelry-making are: a semi-industrialzed craftsmanship and know-how; the long duration of training and expertise; a limited supply of raw materials; a globalized, cyclical market; and big groups that ever more often set the pace and organize this business sector. Given this context, this research has brought to light several possible business strategies for subcontractors in the fine jewelry business. Given the strong interdependence between subcontractors and their principals, both parties can adapt together in several ways. Even in a value chain where supplier/client relationships can be seen as an asymmetrical "lordship", with the principals exercising a strong hold (DONADA and NOGATCHEWSKY 2008), subcontractors have the choice between several possible strategies. Without seeking to attain a dominant position in the value chain, they can adapt to its reconfiguration while obtaining more room to maneuver in line with their own capabilities. The four types of adaptation identified herein — protection, specialization, cooperation and coopetition — define, in a given strategic context, the conditions of adaptation and related issues. This typology is intended to be educational: to present a range of solutions in situations where ideas about the value chain might have come petrified.

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