**Appendix G: challenges and opportunities of AM in the medical sector vs the aerospace and automotive sectors**

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| **Challenge** | **Comparison with automotive and aerospace sector** | | |
| **Higher relevance for medical sector** | **Equal relevance** | **Lower relevance for medical sector** |
| Dependency on Supplier (C1) |  |  | The limited number of suppliers is perceived more in the automotive and aerospace sectors since there is a higher demand of AM parts |
| High Production Costs (C2) |  |  | The focus of the medical sector is on responsiveness rather than keeping the costs low as for automotive and aerospace sectors |
| High Investment Costs (C3) |  |  |
| High Material Costs (C4) |  |  |
| IP Issues (C5) |  |  | Medical sector has a one-off production, while automotive and aerospace sectors have higher volumes, which are more likely targets for IP/data thefts |
| Social Sustainability (C6) |  | Both have low relevance since in both AM and CM (e.g. CNC and injection molding machines) one operator controls more than one machine |  |
| Standardization and Certification (C7) |  | This is of high relevance for both, with both asking for AM-specific standards |  |
| Material Limitation (C8) | While some aerospace and automotive parts can be manufactured with a different material, medical products are very strict due to biocompatibility issues |  |  |
| Specialized Workforce (Design Phase) (C9) |  | This is of high relevance for both, with both asking for AM-related skills development |  |
| Specialized Workforce (Production Phase) (C10) |  |  |
| Production Limitation (C11) |  |  | This is more relevant for aerospace and automotive sectors where the production volumes are higher; moreover, in aerospace and automotive the size limitation is also relevant, not only speed |
| Need for post-process operations (C12) |  | Also for aerospace and automotive sectors, the relevance depend on the final application |  |
| Quality (C13) |  |  | This is more relevant for aerospace and automotive sectors where quality is a matter of comparison of CM |
| **Opportunity** | | | |
| Hedged Sourcing Strategy (Demand Risks) (O1) |  |  | This is more relevant for aerospace and automotive sectors given their higher volumes and demand variabilities |
| Resilient Supply Chain (O3) | Although being relevant for both, it is more important for the medical sector where high responsiveness is crucial for patients’ lives |  |  |
| Environmental Sustainability (O4) |  |  | This is relevant for both but it has more impact in the given the aerospace and automotive sectors given their higher production volumes |
| Customization (O6) | In the medical sector, the design flexibility and freedom of AM are leveraged for producing customizable medical parts, while in the automotive and aerospace sectors, instead, for lightweight products |  |  |
| Responsiveness (On-Demand Production) (O7) | This is more relevant for the medical sector for ensuring responsiveness, which is deemed more in this sector |  |  |
| Responsiveness (Geographical Convenience) (O8) |  |  | This is more relevant in the aerospace and automotive sectors due to the geographical complexities of the supply chain (multiple tiers are present here) |
| Waste Reduction (O9) |  |  | This is more relevant the aerospace and automotive sectors where it is expected to have more impact given their higher production volumes |
| MTO Production (O10) |  | This is relevant for both, mainly for the increased responsiveness for the medical sector and for the reduced inventory levels for the aerospace and automotive sectors |  |
| Simpler Supply Chain (O11) |  |  | The aerospace and automotive sectors are characterized by a much higher number of tiers of suppliers, manufacturers, distributors and service providers than the medical sector |
| Part Consolidation (O12) |  |  | This is more relevant for aerospace and automotive sectors where products are made of many more components than in the medical sector |
| Shareability (O13) |  |  | This is more relevant in the aerospace and automotive sectors due to the geographical complexities of the supply chain (multiple tiers are present here): parts can be shared online and produced on-site |

**Table G1.** Relevance of challenges and opportunities in the medical sectors with respect to the aerospace and automotive sectors. Source: Created by author.