APPENDIX

APPENDIX 1: TRAITS IN THE ARTWARE/HANDICRAFT INDUSTRY

Traits prevalent in the metal artware/handicraft industry (source primary data):

1. **Dhalaiya:** The artisan responsible for carrying out ‘Casting’ works metals e.g. Brass, Aluminium, and Cast Iron etc.
2. **Polisher:** The artisan responsible for carrying out ‘Polish’ work on the items by buffing/polish machines and by other hand tools
3. **Welder:** Performs eclectic or gas welding to join metal pieces.
4. **Machine Man:** The artisan responsible for carrying out machining operation on Lathe Machine, shaping machine, drilling machine, mill machining grinding machine on the items like, machining, drilling, boring, grilling, cutting, threading, slot making etc.
5. **Plumber:** The artisan performs various joining works on pipes and fittings like pipes fitting in bathrooms, kitchen and plants. And carrying out many pipe works related to items
6. **Electrician:** Artisan responsible for doing wiring work, looking after electrical needs of a factory. Helping factory in maintenance of DG (diesel generator)
7. **Carpenter:** An artisan looking after carpentry works. Now a day, wooden items export is on increase. Many multinational companies have introduced semi-automatic and fully automatic machines for wood work. Hence, there is ever increasing demand for the employment of carpenters and electricians.
8. **Painter:** An Artisan performing painting operations on the items for providing final finish. There is ever increasing high skill requirement of painter as painting operations have gone on high skill. Painting operations are carried out manually, by semi-automatic and by fully automatic machined. There are separate painting plants for specific painting needs and quality.
9. **Thathera:** a very unique class of artisans. They make spots (circular) on brass and aluminium (big in size) by manual hammering (with small hammer) on the piece at a close and almost at same distance (identical to previous one). It provides a different type of a glaze on the piece. It makes loud and thundering sound while hammering piece. This art is uniquely available in Moradabad and Saharanpur in UP. China did try to bring out this
particular finish in their country by automation through computers but failed to achieve the finish. The continuous hammering on the item with particular frequency and speed while piece is also kept rotating by the same person or by his co-worker with a specific speed and direction of rotation is not any body’s baby. This type of work is done by a particular type of community and they work on their own terms and place. They do work in factories for some specific work for an agreed period.

10. **Chhillaia:** They perform scrapping operations on the brass wares for providing shining finish and for thinning and for giving particular shape and slope.

11. **Mistri:** A Master craftsman who can perform major functions for making the Artware. He plays a leading and guiding role in the factory. He also helps in expediting production chain and meeting shipment schedule.

12. **Engraver:** By his small hammer and chisel, an artisan is able to make varying depth grooves on a brass piece and converting them into the shapes of some objects e.g. flowers, shrubs, plants and building etc. Master craftsmen can portray a photo of a human being or animal like lion on brass item by engraving. This unique art of engraving on brass items like planters, show-pieces has given fame to Moradabad world over. The **Engraver** is also known as ‘**Dastkar**’ and this art work is known as ‘Dastkari’ means art work performed on a metal ware by an artisan by hand.
APPENDIX 2: METHOD OF PRODUCTION

Primarily Copper and Brass metals are used in manufacture of Art ware. Gold, Silver and off late Titanium metals are also used for Art ware. But the uses of these metals have some limitations because of their high value of cost. Only on specific requirements, Art wares are made of Gold and Silver.

Over the period with advent in designs and frequent changes in the use of Art ware, cost plays a major role in the whole process. The rising cost is now being neutralized by use of different low cost materials with innovative designs and intervention of machines. The new and latest machines have opened new dimensions in designs and cost. Some of the commonly used metals are: Aluminium, Iron, Wrought Iron, Stainless Steel, Wood, Plastic, Resin, Glass, Wax, PVC, Fibre, Jute, Hindalium, Rubber and Paper

For making Metal Artware, the items have to pass through different manufacturing stages. The manufacturing process has three parts:

- Melting
- Casting
- Polishing

Copper is melted at 900-940 degree C. It is then mixed with zinc and other metals. Brass is the most commonly used metal for making Artware. The standard composition for Brass is alloy of Copper and Zinc in the ratio of 60/40. Brass Artware are made in different ways i.e. by machining and by casting also. Sand based metal casting process is used in making metal handicraft items. A mould cavity is made with sand mixture and molten liquid is poured in it. It is then allowed to cool and solidify and then separated from the mould. The use of sand mixture in sand casting is known as binder. The impression of pattern is taken over the binding metal or alloy. The binder is made using Ram Ganga sand (80% to 95%), black clay (2% to 4%), mustered oil (5%) and molasses (2% to 10%) sand casting. Sand is used as a refractive material in sand moulding system. Molasses is used as a binding material.

The flask used for the casting made of steel, aluminium or wood and are of different sizes and shapes and slightly bigger in size the pattern. It generally has two parts, the cope (upper part)
and the drag (lower part). In casting, a sprue is the passage through which a molten metal alloy is introduced into the mould cavity. The uniqueness of the flask used in Moradabad is its side sprue. The mould is known as pattern as it carries the replica of what is to be made by casting.

The pattern designing is done using Computer based designing software like Computer-aided design (CAD). A slightly over-sized master pattern is made of wood, wax, metal, plastic or other material. Both the Computer aided Machine (CAM) manufacturing and the manual manufacturing of pattern are common in Moradabad. From the master pattern, multiple patterns are made. The Moradabad metal industry generally uses wooden patterns. The pattern needs to incorporate suitable allowances for shrinkage which is known as contraction allowances. The Exact value of contraction allowance depends on the alloy being cast. In the sand casting procedure, first, the mould is placed on a board. Sand binder material is sifted over the pattern until the model is covered by a few inches of sand and the outer circumference of the same is covered by a round metal ring. It is reversed and put into the moulding box (cope) and covered with the binder sand and pressed. This process creates an impression on the binder material filled in the mould. This creates the upper portion of the sand mould. Similarly the lower mould (drag) is prepared by making the impression on the sand binder material. The upper half of the mould (cope) is placed over the lower half of the mould (drag). Both carry their respective mould impression on the sand binder material. The bowl like opening known as sprue, is the inlet for the molten metal to be poured inside the mould and to fill-up the space (cavity) created by the mould impression. The metal of which the desired sand casted good is to be made is melted and poured in the mould box through sprue. The mould box is left in open for cooling down and providing time for the molten metal poured in to solidify and take the desired shape. The mould box is opened and the binding material is removed to secure the good prepared by sand casting technique.

The item so obtained is called ‘KORA’ i.e. unfinished item and needs further finishing and polishing.

**I. Finishing and Polishing:**

The granules appear on the surface of casted goods and the surface use to rough. The requirement for making the surface of the good is fulfilled by scratching the surface by an edge
tool with flat steel blade with a cutting edge known as chiselling tool. In the chiselling process the upper crest of the surface, at which the process is applied, gets peeled-off and unwanted material gets removed. This makes the surface of the good smooth and bright. The turning machine and chiselling tool are also used for giving curves and threading in goods to achieve the desired texture in the surface of the goods.

The Grinding or Buffing machine is used for polishing the surface of the finished goods.

II. Coloring and Packing

The items which do not require colouring are sent directly for the silica polishing or else are first coloured. Different techniques are used for colouring. First and the foremost, there are goods on which some kind of carving (especially hand carving) has been done. After the carving, the carved portion of the good is coloured. For colouring, it is dipped into a container filled with hot colour for some time. This process provides colours the surface of the dipped goods and then heating process is applied to the goods to fix the colour.

III. Powder Coating and Electroplating

The process of powder coating is also in practice. The method for colouring the goods is using electroplating technique. Electroplating is a process of using electrical current to reduce cations of a desired material from a solution and coat a conductive object with a thin layer of the material, such as a metal. Electroplating is primarily used for depositing a layer of material on an object. The process used in electroplating is called electro-deposition. The part to be plated is the cathode of the circuit. The anode is made of the metal that would be used for plating on the part. Both components are immersed in the electrolyte containing one or more dissolved metal salts that provide ions that permit the flow of electricity. A rectifier supplies a direct current to the anode oxidizing the metal molecules that comprise it and allowing them to dissolve in the solution. At the cathode, the dissolved metal ions in the electrolyte solution are reduced at the interface between the solution and the cathode such that they plate out onto the cathode. The rate at which the anode is dissolved is equal to the rate at which the cathode is plated, vis-a-vis the current flowing through the circuit. In this manner, the ions in the electrolyte bath are continuously replenished by the anode. Nickel, Copper or aluminium is used for electroplating. Antique finish metal handicrafts
are also made on customer demand by painting and plating. The finished goods are then packaged in different types of packing cartons and boxes. Nowadays, specific care is taken in designing packing cases and labelling.
APPENDIX 3: CHECK-LIST FOR DATA COLLECTION

Following checklist / questionnaire was used during the study.

Introduction of the company

- Firm Owner / Entrepreneur:
  - Year of establishment
  - Educational Background
  - Age
  - Gender
  - Origin
  - Who started the business

- Company:
  - Legal Framework
  - Number of employees
  - Is it a family run company
  - What is the core product/service of the company
  - What is your position in the company
  - In your opinion, what is the status of the company? (probe: start-up / growing / growth happened / saturated / diversifying)
  - If it is growing, what are the factors, you think help the company to grow (internal and external)
  - If it is not growing, what is the cause in your opinion? (Cost / competition/ loss making etc...)
  - In your opinion what factors hamper the growth of your business
  - How did you manage to address these factors in the past and how much success was achieved?
  - How is the competition in your business field and local area?
  - Has your firm been involved in introducing a totally new product during the last 3 years
  - Have your acquired any new technology or upgraded an existing product line
In your view, how innovative are Moradabad based firms

Internal Factors

- PERSONNEL CAPABILITY
  - What is the typical educational and social background of your employees
  - Do you think it is difficult to find appropriately educated staff
  - Is retaining your staff difficult?
  - How often you communicate with your employees
  - If a worker in production has an idea about the product or anything else would they talk to you and inform you about it?

- STRATEGY
  - What is your company’s growth strategy (approach to growing the business)?
  - What are the most important goals of your company - in short, medium and long term?
  - How would you define growth/success achieved in business so far?
  - Do you do planning for a time horizon more than 3 years? If so how do you consider internal and external factors that may affect the plans
  - Where do you perceive your position in the market and do you find competitors hampering your firm growth?
  - Do you perceive other countries especially these with low production costs as competitors due to globalization
  - What is your strategy to market your company and to find new customers
  - During last 10 years, have there been instances where you have completely changed the operating model of your company? Why?

- OPERATIONS CAPABILITY
  - How important is location for your company to your business growth?
  - In your view, would it be beneficial to have a location change/expansion?
  - What are the main advantages that Moradabad offers for your company, and disadvantage as a place of business
What are the main changes in the situation of small business firms of Moradabad during the past 5 years

What are the internal procedures and policies to handle marketing? Do you have dedicated marketing staff?

External Factors

**TECHNOLOGICAL FACTORS**
- Do you have all the required tools and technology available within your company? If not, what are the obstacles to purchase them?
- What is the source of knowledge of new technologies?
- How would your company finance an expansion or an investment in new technology?
- Do you face any difficulty with adoption of advancements in technology?
- Do you find it difficult to get access or acquire new technology? Do you find it difficult to stay innovative?
- How much time and money you spend on research and development?
- In last 5 years, what new tools or technologies have you employed? What have been the impacts of these technologies on your business?
- In your view, is new technology a factor which is helping your competitors grow their business?

**FINANCIAL FACTORS**
- What are the main obstacles in getting the required finance for your business?
- How much of your business is financed through internal sources?
- What external finance organizations/mechanisms are leveraged for business?
- In your view, would access to large financial institution or government support help grow your business?
- In your views, what’s the impact of government’s tax and other financial policies on your business?
- During last 5 years, which financial regulations have impacted your business (in both positive and negative way)?
- In your view, to what extent does your business get impacted by the global economic situation

**REGULATORY FACTORS**

- Are there any governmental laws/ restrictions that influence in the growth of your company? If there are, can you mention some of the obstacles?
- In case you have received support from government institutions - what kind of support?
- How could governmental policies and regulations be amended in order to promote small business firms?
- How much influence does your business community have on government policy making (local/national)
APPENDIX 4: SMALL AND MEDIUM ENTERPRISES (SMES)

During the literature review, it was observed that there is no universal definition of SMEs. Countries have used various criteria for defining SMEs. Some countries use turnover of the company to determine the size of a firm, whereas some use fixed investment or the number of employees (Lokhande 2011), sales volume and worth of assets (Rahman, 2001). In most of the countries, SMEs are defined in terms of the number of employees whereas in India, investment in plant and machinery is the criteria for defining SMEs. In India, the size of SMEs is defined as industries having investment in plant and machinery, for small scale industry it is less than Rs. 50 million and for medium scale the limit is Rs. 100 million (SIDO, 2005). The definitions of SMEs have been changing from time to time. The latest definition used for this study is from the recently enacted MSMED Act, 2006. The Act categorizes SME into Micro, Small and Medium Firms. The Act defines SMEs as depicted in Table 14.

<table>
<thead>
<tr>
<th>Segment</th>
<th>Manufacturing Firms</th>
<th>Service Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro</td>
<td>Up to Rs. 2.5 million</td>
<td>Up to Rs. 1 million</td>
</tr>
<tr>
<td>Small</td>
<td>More than Rs. 2 million and up to Rs. 50 million</td>
<td>More than Rs. 1 million up to Rs. 20 million</td>
</tr>
<tr>
<td>Medium</td>
<td>More than Rs. 50 million and up to Rs. 100 million</td>
<td>More than Rs. 20 million and up to Rs. 50 million</td>
</tr>
</tbody>
</table>

Source: MSMED Act, 2006

As per this Act, these firms are classified in two categories; manufacturing firms and service firms. As shown in the above table, the firms engaged in the manufacturing or production of goods is defined in terms of investment in plant and machinery.

As per MSMED website\(^{22}\), a Small Scale Industry is defined on the basis of the limit of value of investment in plant and machinery, which is more than twenty five lakhs rupees and does not exceed five crores rupees. A medium scale industry is defined on the basis of the value of

\(^{22}\) Accessed on 15/12/2013
investment in plant and machinery, which is more than five crores rupees but does not exceed ten crore rupees.

The Indian definition focuses more on the investment amount, whereas most of the other countries define small and medium firms (SMEs) in terms of number of employees and turnover. The below given table as per SME White book 2009-10 gives details of other countries defining SMEs.

Table 15: Country wise definition of SMEs

<table>
<thead>
<tr>
<th>S No.</th>
<th>Country</th>
<th>Small Firm</th>
<th>Medium Firm</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Malaysia</td>
<td>Turnover: 2.5 – 10 Lakh</td>
<td>10 – 25 Lakh</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Av. Emp. Strength: 50</td>
<td>150</td>
</tr>
<tr>
<td>02</td>
<td>Hong Kong</td>
<td>Av. Emp. Strength</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 100 Employees/ manufacturing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 50 Employees /non-manufacturing</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>China</td>
<td>50 – 100 Employees</td>
<td>101 – 150 Employees</td>
</tr>
<tr>
<td>04</td>
<td>European Union (EU)</td>
<td>&lt; 50 Employees</td>
<td>&lt; 250 Employees</td>
</tr>
<tr>
<td>05</td>
<td>United Kingdom (UK)</td>
<td>Turnover: £ 5.6 million (Rs. 56.2128 Cr)</td>
<td>£ 22.8 million (Rs. 228.8664 Cr)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Around 50 Employees</td>
<td>Around 250 Employees</td>
</tr>
<tr>
<td>06</td>
<td>Canada</td>
<td>50 – 100 Employees</td>
<td>Around 500 Employees</td>
</tr>
<tr>
<td>07</td>
<td>Japan</td>
<td>&lt; 300 Employees</td>
<td>--</td>
</tr>
<tr>
<td>08</td>
<td>United States of America (USA)</td>
<td>Investment capital - 100 million Yen (Rs. 5.83 Cr)</td>
<td>Turnover: $ 0.75 – 29 million (Rs.4.5405 – 175.556 Cr)</td>
</tr>
</tbody>
</table>

Source: SME White book 2009-10 (currency conversion rate applied as on 29.08.2014)
APPENDIX 5: MAPS OF MORADABAD

The following maps provide a glimpse into the field of study, Moradabad and its surrounding areas.

Figure 20: Moradabad District Map (source: www.mapsofindia.com)

Figure 21: Moradabad and its satellite towns that cater to the skilled manpower