

UNIT - 5

AM Applications :-

- ~ Aerospace industry & suppliers
- ~ Automotive industry & suppliers
- ~ Machinery [e.g. turbines, special machinery]
- ~ Medical implant [Dental, orthopedic]
- ~ Handling and Robotics.
- ~ Lifestyle & sports [e.g. Jewelry, Biking]
- ~ Custom parts [e.g. classic car parts, surgical tools]

Material Applications (or) Material relationship

- ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
- Material relationship means a familial, financial, professional, employment or other relationship that would reasonably be expected to impair the objectivity of the director's judgement when participating in the action to be taken.

Design

- ← service conditions
- ← function
- ← cost

processing

- ← equipment selection
- ← influence on properties
- ← cost.

Materials

- ← properties
- ← Availability
- ← cost

Design of Applications:

→ Web Applications design is an important stage. When building a Web Applications.

- It focuses on the look and feel of the Web Application.
- The design stage encompasses several different aspects, including user interface design (UI), usability (UX), content production, and graphic design.

Application in Engineering:

- Applications Engineering is a hot trend in the current IT market.
- An Applications engineer is responsible for designing and applications of Technology products relating to various aspects of computing.
- the specific role of a computer Applications engineer is to create, design and test computers software programs.

Analysis and business planning:

- Business planning is necessary to keep company goals and objectives on track.
- successful business planning requires much more than writing out set of ideas and aspiring to see them through.
- According to the Small Business Administration, business planning "guides you through various phases of your business."
- carefully analyzing the direction your company is headed and measuring its potential for achieving company goals is a major part of business planning and analysis.

Aerospace industry:-

- The Aerospace industry is engaged in the research, development, and manufacture of flight vehicles, including unpowered gliders and sailplanes, lighter-than-air crafts, heavier-than-air craft.
- rotary wings; see airplane; military aircraft, missiles.

Automotive industry:-

- The Automotive industry comprises a wide range of companies and organizations involved in the design, development, manufacturing, marketing and selling of motor vehicles.
- It is one of the world's largest industry by revenue.
- the automotive industry does not include industries dedicated to the maintenance of automobiles following delivery to the end-user, such as automobile repair shops and motor fuel filling stations.

Jewellery industry:-

- The Jewelry Industry has traditionally been regarded as one which is heavily craft-based and automation is generally restricted to the use of machines in the various individual stages of jewelry manufacturing.
- The use of RP Technology in Jewelry design and manufacture offers a significant breakthrough in this Industry.
- An experimental computer-aided Jewelry design and manufacturing system jointly developed by Nanyang Technological University and Sintech Institute of Manufacturing Technology in Singapore,

- The SLA was used successfully to create fine jewelry models.
- These are used to master patterns to create the rubber molds for making wax patterns that were later used in investment casting of the precious metal and product.
- In an experiment with the design of rings, the overall accuracy of the SLA models were found to be promising especially in the generations of intricate details in the design.
- With the use of better scans and finer layer thickness, this problem was reduced but not fully eliminated.
- Further processing was found to be necessary, and abrasive jet deburring was identified to be most suitable.

COIN INDUSTRY:-

- Similar to the jewelry industry, the mint industry has traditionally been regarded as very labour-intensive and craft-based.
- It relies primarily on the skills of trained craftsmen in generating the "embossed" or relief design on coins and other related products.
- In another experimental coin manufacturing system using CAD/CAM, CNC and RP Technologies developed by Nanyang Technological University and Gintec Institute of Manufacturing Technology in Singapore,
- the SLA was used successfully with a Relief Creations software to create tools for coin manufacture.
- In the systems involving RP technology, its working methodology consists of several steps.

- Firstly, 2D artwork is read into ArtCAM, the CAD/CAM system used in the system, utilizing a sharp JX A4 scanner.
- the 2D artwork of a series of Chinese characters and a roaring dragon.
- In the ArtCAM environment, the scanned image is reduced from a color image to a monochrome image with the fully automatic "Grey scale" function.
- The second step is the generation of surfaces. The shape of a coin is generated to the scanned size in the CAD system for modeling building.
- A triangular mesh file is produced automatically from the 3D model.
- This is used to as a base onto which the relief data is wrapped and later combined with the relief model to form the finished part.
- The third step is the generation of the relief.
- In creating the 3D relief, each color in the image is assigned a shape profile.
- There are various fields that control the shape profile of the selected colored region, namely, the overall general shape for the region.
- The curvature of the profile the maximum height, base height, angle and scale.
- The fourth step is the wrapping of the 3D relief onto the coin surface.
- This is done by wrapping of the 3D relief onto the triangular mesh file generated from the coin surface.
- This is a true surface wrap and not a simple projection.

→ The fifth step is to convert the triangular mesh files into the STL file format.

→ This is to be used for building the RP model.

→ After the conversion, the STL file is sent to the SLA to create the 3D coin pattern which will be used for prototyping of design.

GIS Applications:

→ The transport system GIS used for transport application is known as the geographic information systems. for transportation GIS-T application are currently used broadly by Transportation Analysis and decision makers in different areas of transportation, planning and engineering, from infrastructure planning.

coal mine fire
management.

forest fire
Management

Disaster
management

Waste Water &
Management

GIS Application.

Air pollution &
control

Natural resources
management

Arts and Architecture:-

Arts:-

By chipping a marble away a layer at a time to get the exact form he had visualised, Michelangelo accomplished to the greatest potential of his work. most of his later unfinished works of art which are were created

using similar methods give a strong impression of objects created by stereolithography caught in the moment of rising from a vat of resin but hardened and frozen in time. It may not have been an additive or rapid process, but it is a multi-degree of freedom layered fabrication method that is conceptually similar to some types of contemporary rapid prototyping technology.

Architecture:-

As mentioned earlier, architecture and construction is an area being changed by rapid prototyping when more and more companies see the vision that the Chinese company, WinSun, is bringing into reality the issue of homelessness will be solved. Imagine being able to literally, point, new houses in every part of the world. Solving such a problem would allow veterans, third world countries and people living on the street to get their lives back on track and create their own impact in the world.

RP medical and Bio engineering applications

The most interesting and challenging applications of rapid prototyping technologies are in the field of medicine. RP medical models have found applications for planning treatment for complex surgery procedures, training, surgical simulation, diagnosis, design and manufacturing of implants as well as medical tools.

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* planning and simulation of Complex Surgery:

→ The purpose of this study is to assess benefits of Computer-aided Surgical simulation (CASS) and compare it with current surgical planning.

→ The comparison of methods applies to all CMF surgeries where the patient's condition is severe enough to undergo a Computed tomography scan and a stereolithographic model is necessary for the surgical planning process.

→ Adv?

→ Faster & less costly than the current standard planning methods for Complex CMF surgery.

→ Thus, in all regards, CASS appears to be atleast as good as the current methods of surgical planning.

* Customized implants & prostheses:

→ Based on 3-D implant planning software for Computed tomographic (CT) scan data, customized surgical templates and trial dental prosthesis could be designed to ensure high precision transfer of the implant treatment planning to the operative field and an immediate rigid splinting of the installed implants, respectively.

* Design and production of medical devices:

→ Steps in design a medical device

1. Identification - opportunity and risk analysis

2. Formulation - Concept and feasibility analysis

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3. Design development, including verification and validation to ensure the design output matches the specified design input.
 4. Final validation and product launch preparation.
 5. Product launch and post-launch assessment.

* Forensic Science and Anthropology (Anthropology)

→ Forensic anthropology is the application of the anatomical science of anthropology and its various sub-fields,

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UNIT-2 → 14 Pages
UNIT-3 → 26 Pages
UNIT-4 → 16 Pages
UNIT-5 → 10 Pages

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