







Jorge Mauricio Rodríguez Cuevas

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I am a **Senior Creative Designer, Researcher, and Senior Design Engineer**, specialized in applied innovation to find out new opportunity gaps, with 24 years of experience (*last 14 years as Design leader and Project Director*) in the development of products and services for diverse industries like the automotive and mobility, as well as Medical, Construction, Furniture, and Product, at the national and multinational level. **I have the ability to understand and recognize market requirements and opportunity areas (Product Opportunity Gaps)** to transform them into feasible, useful, usable, and beautiful products, **through the application of principles of innovation, as well as the implementation of processes and strategies of advanced design like User-centered design (UCD), User experience (UX), and design engineering, including design for manufacturing (DFM) and design for assembly (DFA), to leave the product ready for product engineering.** I am also specialized in supplier development and I have the ability to understand both the world of design and the world of engineering to achieve communication between both teams to make the workflow more effective and optimal.

Professional objective:

Because I am a highly passionate person in my profession, my goal is to always achieve the best results. My motto is: **"Make things happen"**. Therefore, my personal mission is to always be the right arm of all my colleagues and collaborators and teammates, both internal and external, facilitating things to be carried out to achieve great results. This is why I look for ways to be empathetic with both the work teams and the project requirements by applying multiple leadership strategies, managing resources, and being innovative and paradigmatic to find breakthrough solutions to complex problems.

All the work stated next can be verified with evidence on my professional page:
www.rodzmas.com

Professional objective:

I Got my Industrial Design Bachelors degree at CIDI UNAM (Industrial design Research Center at National Autonomous University of Mexico) From 1990 to 1994, I specialized in Automotive Design at CCS (College for Creative Studies) in Michigan from 2001-2002. I have built my career by developing my professional practice through three pillars: 1) Professional practice, where I have gained experience on the battlefield; 2) Research, where I theorize and question practices, develop theoretical models for the best execution of the practice; and 3) University teaching, where I keep learning and explore my design models and theories.

The Practice: I worked in the General Motors Co. Design Studios over the Design studios at GM of, Mexico, Design Center at Michigan U.S., between 1996 and 2004; From 2005 to 2009, I started my own design office, having 24 employees (HUNPEL STUDIOS SA de CV), we provided design services for the motor transport, heavy duty machinery, equipment for laboratory and specialized furniture for industries. Hunpel went bankrupt in 2009 due to the great crisis, which led me to implement a new work strategy where I had to apply a total reinvention of my way of working. This is how "RODZ + Design & Innovation Consulting" was born. Because of all the contacts and relationships accumulated during the experience, the services had been executed by teaming up with colleagues of excellence and brilliant alumni since the beginning. The projects have been developed in a strategic way through teamwork coordinated by me, that is why RODZ + operates until today as a single multidisciplinary brain, approaching each project in a singular way, depending on the requirements and needs of the different types of clients, a characteristic that has allowed us to provide diverse services in advanced design, UX - Ui services, and approaching techniques for innovation through consultancy and/or coaching, for companies such as Ford Motor Co, Mazda, Crown Lift trucks, GM (MAVEN), Prinsel SA de CV, Mabe, The University of Cincinnati (DAAP), University of Wester Illinois, Pininfarina, AUDI, Chrysler, Airdesign, Hankook tires, Irizar Autotransportes, Operbus, Kenword, Miguel Angel Aragonés Architects firm, General Transportation Fund, Inc. California, and many others, nationally and internationally.

The Research: Along with professional work, the last 11 years I have worked intensely trying to order and understanding the complexity of the intricate topics of design and innovation, approaching these topics by the scope from philosophic thought and complementing this knowledge by means of understanding of the human being, its cognitive psychology, its culture and history. This way of approaching design has allowed RODZ+ to create theoretical models and strategies to understand the "fuzzy frontend" of any project because I have been creating an algorithm to understand the DNA of these topics to be able of finding out the right heuristics to face every project in particular. Furthermore, through this research, I have been able to create very interesting processes and practices, which have given me effective tools for the development of design, from their initial understanding of their final development.

The Teaching: From an early age I always liked teaching, so since 1998 and uninterruptedly until today, I have served as a design teacher mainly, at bachelor and master levels in universities such as The Anáhuac Norte University, the Technological Institute of Higher Studies of Monterey (North Campus, Sta. Fe Campus, and Toluca Campus), the Ibero-American University, Rigoletti House of Design, the Autonomous State of México University at the School of Design, University of Cincinnati (DAAP), as well as at the School of Architecture from the University of Western Illinois, as a Master Advisor. In addition, I have had the honor of having been invited on multiple occasions as a speaker and exhibitor on design and innovation on national and international stages.

During my 25-year professional career, I have received multiple awards and recognitions. Publications about my work have been edited in several books and magazines, and additionally, I have published various "indexed papers". Additionally, I have given approximately 132 lectures, workshops, and masterclasses in Mexico, Guatemala and the United States.

COMPETENCES

MANAGEMENT AND LEADERSHIP :

- Team management, development, and skill evaluation. (ERAM & PPF, and TC (theory of constraints)
- Leadership by empathy and assertive communication (LBE)
- Project administration and management. (more than 50 project managed successfully)
- Supplier development.
- Speaker on Design and Innovation & personal management. (More than 150 talks national & international level)
- Self management and entrepreneurship.
- 5S and TQM champion.
- ISO 9000 champion.

DESIGN

- Advanced design conceptualization for new products.
- Strategic design for product design and engineering.
- Innovation Management for product and service development.
- User-Centered Design: optimization of usability and product interaction through user experience (UX – Journey Wheel) practices. ([Cognitive psychology and gestalt principle](#))
- Advance packaging practices for control panels, human interaction and interfacing, and vehicle driver compartment.
- Automotive and mass transportation interior component design.
- Product design. ([Furniture, Urban furniture, Medical and lab equipment, specialized furniture & living space design](#))
- UX – UI: ([Design for analog interaction and digital interfacing](#))
- Biomimicry and Biomechanics applied to design.
- Sustainable design principles for product design.
- Styling: Applying brand character cues and marketing directions, through advanced practices of product characterization (Aesthetics syntax).
- Knowledge of stylistic refinement practices to achieve visual harmony in terms of balance and proportion, as well as harmony of shape and form, contrast, color and texture & assembly harmony practices ([Robust Design](#)).
- Knowledge of the latest technological and stylistic trends for the conceptualization of new products and components.
- Knowledge in the harmony and appearance processes, for the evaluation of colors, textures, grains, and finishes in plastic and metallic components, through color and harmony rooms or through Macbeth lighting booths. This evaluation is made with purpose of making component match in products, making the design theme look harmonious, avoiding problems of contrast or color saturation, as well as problems of metamerism when lighting changes.
- Advance mental mapping for Advanced design strategies making. (Mind Manager Mindjet 2018 and LucidChart)
- Lean strategies for robust design and engineering.
- Branding and logo design.

COGNITIVE PSYCHOLOGY AND HUMAN FACTORS:

- Deep knowledge in human factors and ergonomics to ensure that the user can have optimal usability of products, screen reading and interfacing.
- Good knowledge of Cognitive Psychology factors for the correct design of usability algorithms and heuristics, to ease the user interaction with control components and ensure its readability and comprehension, avoiding problems of cognitive delay and perception.

TECHNICAL:

- Transformation of thermoplastics: Design of components by Vacuum-forming and injection molding.
- Evaluation of class "A" appearance surfaces for release of components to engineering.
- Evaluation of engineering "B" surfaces.
- Evaluation of plastic injection components for their release to texturing processes.
- Manufacturing of components in composite materials:
- Transformation of thermoplastics and aluminum alloys by extrusion process.
- Transformation of sheet metal.
- Manufacturing by die casting in aluminum and zamak
- Tubing bending process and metal and plastic extrusion.
- Prototyping of models, physical mockups and prototypes.
- Welding metal processes. MIG, TIG and by electric arch.
- AMEF and PSWC (Failure and Effect Mode Analysis, as well as Process Sequence Workflow Chart.)
- Finishing processes for plastic and metal components. (Electro painting, Chrome plating, Metal galvanization & anodization)
- Assembly and fastening techniques.
- Structures and assemblies design
- DFMA Knowledge: (Design For Manufacturing and Assembly)
- Mechanisms design.

OTHER COMPLEMENTARY TECHNICAL SKILLS:

- Advanced CAD modeling of solids and surfaces in Rhinoceros.
- Use of graphic design programs: Adobe Illustrator and Photoshop.
- CAD rendering in Keyshot.
- Advanced sketching and stereotomy.
- Digital sketching and rendering using Wacom Cintiq and Sketch Book Pro.
- Virtual reality immersive design processes with Gravity Sketch with Oculus system. (under learning)
- Prototyping and handling of multiple physical and bench tools.
- Video editing and Office.

HUMAN DEVELOPMENT

Because as a designer I know that we must design for humanity and its balance with nature, I have got deep into understanding human development. As well as with a have been done with design and innovation. That is why I have been developing "QUMAN" a higher quality human being, through education by means of learning how to know how to think, how to know how to be, for developing the best attitude to know to do balanced design according with nature.

Please look for more information about me (Complete CV, acknowledgments and prizes, courses and trainings, complete portfolio, photo galleries, etc.) at: www.rodzmas.com

<https://www.rodzmas.com/resume>

https://www.behance.net/Jorge_Rodz

<https://www.behance.net/RCDprojects>

At <https://www.rodzmas.com/JorgeRodz> you will find all information like certificates, awards, testimonials, etc.

EDUCATION BACKGROUND AND COURSES.

- 1990 - 1994 – **Bachelor Design in Industrial Design**, Industrial Design Research Center of Universidad Nacional Autonoma de México
- 1996 Renewable Energies for Transportation, Course taken in the framework of the Planet Revival event, organized by The North East Sustainable Energy Association (NESEA) in August.
- 1997 - 1998
 - Unigraphics v.11 "Basic New User", GMM. November 1997 to February 1998.
 - Unigraphics v.11 "Design Simulation", GMM. February 1998
 - Unigraphics v.11 "Advanced Modeling", GMM. February and March 1998.
 - Intensive course "Internal Auditor QS-9000", given by Exel International S.A. de C.V. July 1998.
- 1999
 - Seminar "Instrumental Panel Packaging and Design" Central Michigan University.
 - Seminar "Instrumental Panel Packaging Requirements" GM MID LUX Warren.(January - April).
 - "SurfSeg Fundamentals", taught at RCO Engineering INC. Warren Michigan E.U.
 - "SurfSeg Surface Analysis and Modification", taught at RCO Engineering INC. Warren Michigan E.U.
 - "Unigraphics v13 Free Form Modeling", GM Knowledge Center / General Motors University". WarrenMichigan E.U.
 - "Unigraphics v15 Update", taught at Ockland Community College ". Pontiac Michigan E.U.
- 1999 "Unigraphics v13 Class A Surfacing Applications", GM Knowledge Center / General motors University ". Warren Michigan USA.
 - "Mora DigitizerSystem". SATURN Studios, GMNA Design Center, Warren Michigan.
 - Operation of the Color Harmony Room, for color and texture analysis of surfaces. GM Truck Product Center, Pontiac Michigan.
 - Course "Color and Trim and Appearance Procedures" and evaluation of Masters of color, textures and textiles. GM Truck Product Center, Pontiac Michigan and GMNA Design Studios in the U.S.A.
 - Training in VIRTUALEYES software, for analysis of parts and surfaces in Virtual Reality.GM Truck Product Center / Mock Up area, Pontiac Michigan



- 2001 - 2002
Transportation Design & Human Factors / Visual Communication & Drawing Techniques at College for creative studies, Detroit Michigan USA.
- 2002.
Course "Efficiency in Working Teams", GMM.
"Unigraphics V16 Update", GMM.(July)
- 2003
Rhino3D Cad and Flamingo Rendering Softwares, Indiana University of Pardu (IUPUI), Indianapolis, Indiana, USA. 2002 (Sept - Dec)
Alias Auto Studio Software, Collage for Creative Studies ", Detroit Michigan, USA. (May)
- 2004
Alias Auto Stdio V.11.1, Design Studios of General Motors Corp. Detroit Michigan, USA. (June)
Course "Creativity for Innovative Thoughts", General Motors de Mexico (October)
- 2005
Seminar "Philosophy and Culture of Design" Taught at UAM Xochimilco by Dr. Richard Buchannan, founder of Design Issues Chicago magazine.
- 2009
Micro teaching, given at the Instituto de Estudios Superioresde Monterrey, Campus Toluca, February 9 and 10.
Seminar "Branding & Culture", given by the M.D.G. André Stolarski at the Universidad Autónoma Metropolitana, Campus Xochimilco, from November 4 to 6.
- 2010
BIOMIMICRY, Course (CADI), taught at the Monterrey Institute of Higher Studies, Querétaro Campus, from June 8 to 11.

From 2011 until today, I have taken a great variety of online courses and I have kept shaping my knowledge by my self through researching, reading and talking with mentors and specialized people.

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PROFESIONAL EXPERTISE CRONOLOGY.

2010 - present – RODZ +, Innovation and design consultancy agency. From 2010 to date, I have performed mainly as a project leader in design and engineering, the knowledge I have experienced during my whole professional duty, had given me the ability to manage projects from their conceptual phase, verifying that the products adhere to the requirements of the market or the marketing departments, their feasibility, its stylistic design and its level of manufacturability. My work is focused on reviewing and making projects come true, evaluating the previous topics and facilitating that they are carried out in the best way, through the teamwork of diverse professionals and suppliers. Since then, I have implemented collaborative work remotely using digital tools and video conference. For project execution, I assembled specialized teams with highly skilled professionals, and leveraged the network of all my business connections and suppliers that I had developed. With that combo, was able to provide a wide range of design and engineering services, ranging from specialized furniture products for laboratories and medical equipment, to automotive and mechanical accessories and advanced design projects for international automotive companies, such as Ford Motor Co., AUDI, Chrysler, General Motors, Crown Lift Trucks, Nissan, Seat, Air design and several more. I also have collaborated as a professor at the undergraduate and graduate levels at prestigious universities such as ITESM, U. Iberoamericana, U. of the State of Mexico, Rigoletti Casa de Diseño, and since 2014 to present, I have been the master professor of the Automotive Design Engineering Masters program, at Universidad Anahuac campus Norte.

Since 2015 to present, University of Cincinnati Collaboration: I have had a special collaboration with the University of Cincinnati. At this last place, I have co-led several special industry sponsored projects in their Transportation Design program and their Future Mobility Center. I am currently training their industrial design faculty and their head of transportation design in the topic of automotive design packaging. Through this RODZ+ journey, many of the projects that I have had the opportunity to lead, have been highly recognized by the sponsoring companies as well as have won some awards.

I am a part-time researcher of Design and Innovation topics, writing several articles on the subject and my work has been presented at conferences such as the International Association of Design Research Societies celebrated at the University of Cincinnati in 2017. My work has been published in various books and magazines. Furthermore, I have been fortunate to have been invited as a lecturer more than 150 times by very diverse academic institutions and companies in many parts of Mexico, the United States, and Guatemala.

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2005 - 2009 – Hunpel Studios. Co-founder and leader of the Design area of this 24 employee consultancy firm. 2006 - 2008, Design of 3 urban buses for the company Operbus SA de CV. The strategic design project brought the company from a bankrupt state to a state of financial equilibrium in 1.5 years. The evolutionary design of 3 buses was carried out by joining two chassis (Mercedes and International), in a single production line, standardizing 82% of its components and implementing that many of its processes were carried out by external suppliers to do increase manufacturing efficiency, reducing costs and increasing quality. The company manufactured 1,300 units between 2007 and 2009.

1997 - 2004 – General Motors. Several successes were obtained during my stay, but the most important was being part of the design and engineering team of the Chevy C2 project (1999 - 2003), where I served as Senior Interior Design leader (2001 to 2003 Working at Design Center over General Motors Tech Center at Warren Michigan). After the earlier model lost more than 50% in sales, the new product gained great success after its launch, re-emerging as the sales leader in 2004, going from 24,500 units to 76,000 units in 1 year. The Chairman's Honors Award was also obtained as part of the company's top 5 projects worldwide in 2004. And the car interiors won the National Quorum Design Award, also at the end of that year.

1993 - 1996 – Leader of the Design Team of the First Tonatiuh Solar Car from 1993 to 1995. And global coordinator of the project in 1996. The vehicle was built with composite materials. The team took the vehicle to compete in the United States Sunrayce in 1995, where 2 awards were achieved: the "Composite Award" given by 3M for the best design with the use of composite materials, and The Max J. King Award, an award won by the team for being best representing team spirit. In 1996, the vehicle was entered in the "World Solar Challenge" race held in Australia where we finished 6th in our category. **1995 - 2005 – Formula Electrón México**, the first inter-university competition for electric vehicles in México, designed and built by students and private participants. I was a core part of the team that created the event and the design and manufacturing rules, as well as the competition rules. I remained as organizer of the event for 10 consecutive years, together with the initial team, after which the event was given to the National Auto Parts Industry (INA) and finally in 2017, it was finally retaken by one of the initial competitors. From its beginnings to the present, the event has reached a big relevance similar to the Mini Baja and Fórmula SAE events. More than 15,000 engineers and designers have been trained, many of whom currently work in various automotive industries.

RECOGNITIONS AND AWARDS.

1. Recognition granted by the Faculty of Architecture of the National Autonomous University of Mexico, for having been one of the three best students of the Center for Industrial Design Research in the period 1991 - 1992.
2. Third place in the contest "New Products for the Industry", organized by the Faculty of Accounting and Administration of the UNAM in April 1993.
3. "Dupont Composite Award". 5,000 USD prize. Awarded by the company Dupont Co. To Tonatiuh Solar Auto Design team, for having presented the best design for the use of composite materials (Composites), applied to the bodywork and chassis of the vehicle, during the International Competition of solar cars, "SUNRAYCE'95", made from Indianapolis IN. to Golden Colorado in the U.S.A. in June 1995.
4. "Max J. King Award". Recognition granted to the Tonatiuh Team, for having been a representative of the spirit of competition, integrity and perseverance, in the "SUNRAYCE'95", in June 1995.
5. Creditor of the "DIPLOMA AL MÉRITO" to obtain the professional title "Bachelor of Industrial Design". This recognition was awarded by the UNAM Industrial Design Research Center, for having led a brilliant school career and for the execution and presentation of an excellent professional thesis work. 4 February 1997.
6. Recognition granted by General Motors S. de R.L. de C.V. "Recognition Award for Outstanding Contribution" for the development of fabrics for the platform "S" and "J" 2000, on December 10, 1998.
7. "Recognition Award for Outstanding Contribution" Granted by General Motors de México S. de R.L. de C.V. for solving with great success the P90 isolation door trim panel rattles and squeaks issues, on April 15, 1999.
8. Recognition Award for Outstanding Contribution, granted by General Motors de México S. de R.L. de C.V. for being a member of the team that developed the POPE-MOVIL vehicle for the visit of the Pope on January 22, 1999. The recognition was granted on June 9, 1999.
9. Acknowledgement : "In recognition of all your efforts to help GMM Product Engineering gain ISO 9001 / guide 25 certification" granted by General Motors de México (GMM) S. de R.L. de C.V for being part of the team that achieved the GMM certification in the ISO 9001 guide 25 quality standard. On June 11, 1999.



ACKNOWLEDGEMENT AND AWARDS.

10. Recognition granted by General Corporation "Chairman Honors Award" acquired for being part of the 25 most outstanding members in the development of the CHEVY C2 2004 project. This recognition was delivered by Mr. Rick Wagoner, Chairman & Chief Executive Officer of General Motors Corporation. This award is only given to the 5 best projects of the year at the global corporation level. April 2004.
10. Winner of the XIV National Quorum Design Award 2004 in the Industrial Design Category - Consumer Products, with the Chevy C2 Driver's Cabin Components project. May 2004.
11. Recognition granted by the Instituto Tecnológico de Estudios Superiores de Monterrey campus Toluca, for having obtained an outstanding evaluation in their performance as a teacher, January - May semester of 2009

Design Competences in detail.

- **Advanced design conceptualization for new products.** During the last 11 years I have developed an algorithm for innovation management which had allowed me and my teams to understand the fussy front end of every project and to design an Innovation heuristic to face the project, having detecting the opportunity areas depending on each project nature. I resolve projects understanding people, living and performing in their physical, cultural and geographical contexts, understanding the sponsor, from their needs and goals, as well as objectives, and within their capabilities, infrastructure and culture.
- **Strategic design for product design and engineering.** I prepare strategic plans for project development, depending on the real needs and goals of the sponsor, but matching those goals with their real manufacturing, and commercial capabilities, aligning it with the latest design and technological trends and with their real market segment. I never proceed to design anything before understanding all around the purpose of the project and after analyzing its relevance to care the resources of my clients.
- **Innovation Management for product and service development.** I respect the term innovation very much and therefore, depending on the project, it is the type of innovation that the client is suggested to apply for its development, which can range from **Evolutionary innovation** for products that are losing market, or **Organic innovation**, which is when you want to make significant changes to products, or **Disruptive Innovation**, when you want to try to make a radical change in your developments. Our innovation algorithm allows me to design strategies to be able to proceed on the right path, in addition to the fact that we also make use of a large number of innovation principles that we have been collecting and coining with experience.
- **User-Centered Design: optimization of usability and product interaction through user experience (UX – Journey Wheel) practices. (Cognitive psychology and gestalt principles).** *Once we have understood the PURPOSE of what we want to develop, we develop the design project thoroughly understanding the users, involved in their environments and their contexts, to understand their real frustrations, their problems or their needs. We do all this through very precise simulation tools or deep observation techniques on site, which allows us to throw a large number of initial ideas that we call "seed ideas" and then configure the product or service according to the type of user or users involved in the routines or rituals where the area of opportunity was found.*
- **Advance packaging practices for control panels, human interaction and interfacing, and vehicle driver compartment.** During the last 19 years I have specialized in the packaging of people, components and equipment for control cockpits, passenger compartments, urban furniture and living spaces, for which I have been trained in ergonomics, human factors and biomechanics in order to understand the proper way to that a person or persons can perform effectively and safely within a space or inside a control or driving compartment. In addition, if the control cockpits or panels contain control or manipulation instruments, when designing their lay out, I apply Gestalt principles and knowledge in cognitive psychology to ensure the best reading and interaction of users with the control panels, whether they are analog or digital.

- **Automotive and mass transportation interior component design.** I worked for 8 years in General Motors design studios, specialized in interior design. This experience gave me the bases to continue designing interiors for vehicles of all kinds, from automotive, cargo and utility vehicles, heavy duty machinery, recreational or sports vehicles, in addition to developing the interior configuration I have also designed components of all kinds such as seating, steering wheels, shifter knobs, control panels, garnishings, etc.
- **Product design.** (Furniture, Urban furniture, Medical and lab equipment, specialized furniture & living space design) Through the design techniques described above, I have also developed over the last 12 years a wide variety of products, from their conceptualization and many of them to the market. In the part of technical competences, all the manufacturing processes that I master in order to be able to make the appropriate design for its manufacture are described.
- **(UX – UI) Design for analog interaction and digital interfacing.** In addition to making use of the various techniques of observation and user analysis, as well as simulation, I undertake the task of deeply understanding the disruptive emotions that confuse or complicate the understanding and interaction of people with objects, within spaces. For this reason, I have been trained in cognitive psychology skills, perception, ergonomic and human factors for deep interaction to truly understand how people understand, perceive, think and act in front of a product, especially in moments of excitement or disturbance in unexpected situations. The above has allowed me to design interfaces and products suitable for the type of user to whom the product is directed.
- **Biomimicry and Biomechanics applied to design.** I am a passionate lover of the design that nature applies to all living beings, that is why I have researched deeply on biomimicry and biomechanics, since many of the secrets for innovation are already there and you just have to locate and understand them to translate them into effective and real solutions. I apply many natural principles to developing not only products, but also design strategies.
- **Sustainable design principles for product design.** In addition to the previous point, each time a product is developed, the carbon footprint impacts or collateral damage that it can cause to the environment are measured, therefore we always persuade the client to align its development with sustainability principles, so that this represents the least possible impact. Likewise, we also analyze the human factor and how it can be altered, therefore we also try to always design useful, functional, beautiful and low-impact products, always with the aim of enriching the quality of life of humans in harmony with the environment.
- **Styling: Applying brand character cues and marketing directions, through advanced practices of product characterization (Aesthetics sintaxis).** I have specialized in studying and understanding the channels that must be applied when one applies character to a product. In other words, what it gives aesthetics and presence. This character is subdivided into channels, which we have called "syntax of aesthetics", since just as it happens with a statement where an argument wishes to be transmitted, so we use the syntax of aesthetics subdivided into channels to identify and develop each portion of the aesthetics of a product and to be able to provide everything you need depending on your market or the brand character of a particular company. At the same time we also apply principles of Rhetorics and Poetics to be able to generate a persuasive speech either on the product or a specific brand.

- **Knowledge of stylistic refinement practices to achieve visual harmony in terms of balance and proportion, as well as harmony of shape and form, contrast, color and texture & assembly harmony practices (Robust Design).** When we speak of stylistic refinement, we speak of applying techniques for the beautification of the body of a product, in terms of suitable colors, textures and finishes, but also ensuring that its appearance is congruent with its manufacturing processes, to ensure harmony in terms of perceived quality, thus as beauty in the construction of its surfaces, applying design techniques by means of reflected light and ensuring class “A” surfaces that allow to deliver a great experience through brilliance and reflections of designed light effects.
- **Knowledge of the latest technological and stylistic trends for the conceptualization of new products and components.** As a designer working with innovation, I always try to stay up-to-date with the latest technological, social and design trends, in order to provide adequate advanced design services.
- **Knowledge in the harmony and appearance processes, for the evaluation of colors, textures, grains, and finishes in plastic and metallic components, through color and harmony rooms or through Macbeth lighting booths. This evaluation is made with purpose of making component match in products, making the design theme look harmonious, avoiding problems of contrast or color saturation, as well as problems of metamerism when lighting changes.** When we talk about applying harmony techniques to ensure the correct perceived quality of a product, we are just talking about fine-tuning and refinement of all aesthetic channels that we already talked about, but now in the design engineering process and once the design have already been approved. This refinement takes care of in-depth product analysis and visualization practices under specialized lighting, either within Macbeth color evaluation chambers or rooms for color and harmony evaluation. The analysis carried out are to ensure the equality of the colors applied to a product, the compatibility between textures and finishes, and the harmony existing between the assembly partition lines gaps of a manufactured or integrated product with some components manufactured by different suppliers. This practice ensures that a product be launched to market with the right appearance to make the best impression on the end customer.
- **Advance mental mapping for Advanced design strategies making. (Mind Manager Mindjet 2018 and LucidChart)** I have gotten used to breaking down ideas and concepts through mind maps in order to take advantage of the non-linearity of divergent complex thinking and also to be able to create a focused chaos of information that in a fractal way allows to extract the necessary information when it comes to understanding complexity to land it from a subjective universe to an objective and practical plane that yields useful information for a development. I usually use programs such as MidJet by Mind manager or LucidChart to be able to share with the work team a map of useful information for everyone and where global ideas are concentrated and interconnected.

- **Lean strategies for robust design.** When we speak of robust design, we speak of design thought not to fail, in order to be manufacturable and functional, therefore, applying robust design practices is essential for a concept to become a design that will pass to the product engineering area without problems to be able to be producible, assembled and buildable, that is, the robust design not only touches aspects of DFMA (Design for Manufacturing and Assembly) but it is the action of listing all the design practices that go from usability, the perceived quality, the congruence between the concept and the available manufacturing technology, and the semiotic and brand language that the product must contain.
- **Branding and logo design.** Apply branding practices or branding development, these are techniques to create a brand, from its philosophy, its character, its keywords, its slogan, its logo, in short. A Brand Code must be created to provide identity, either to a new company or to a line of products.

Design Engineering and Technical Competences in detail.

1. Transformation of thermoplastics: Design of components by Vacuum-forming and injection molding.

- a) Vacuum-forming with female molds and male molds.
- b) Vacuum-forming by injection of air with rubber membrane and opened cavity.
- c) Vacuum-forming by hydraulic pressure and hot membrane.
- d) Plastic injection of components with: PP, TPU, ABS, PC, PU, PE, PET and PRTG, TPO, Polyamide, PLA and PVC.
- e) Injection blow molding for the manufacture of closed components like containers, bottles or similar parts.
- f) Rotomolding forming. Design and Manufacturing of Rotomolded Components.
- g) Rapid Injection Molding (RIM). PU and RPU: manufacture of bumpers, moldings, accessories and steering wheels.

2. Evaluation of class "A" appearance surfaces for release of components to engineering:

- a) Evaluation of the "G" factor of tangency and continuity of surfacing.
- b) Component draft angle evaluation, according to the design of the part and the texture assigned to it.
- c) Evaluation of CAD construction by conics or simple equations to avoid complex surfaces with mathematical overload.
- d) Evaluation of visual continuity by reflection of zebra techniques, as well of visual evaluation by light room reflection techniques.

3. Evaluation of engineering "B" surfaces.

- a) Evaluation of nominal thicknesses in surface elements "B" to avoid sink marks in surface "A".
- b) Evaluation of fixation towers, reinforcing ribs, assembly flanges or assembly devices to assure assembly efficacy.
- c) Plastic flow evaluation in the design of a component to avoid flow marks, air vent problems, bubbles or injection problems.
- d) Evaluation of the design of the parting line in a component to prevent flash problems or poor matching of the tooling dies.
- e) Structural evaluation of a plastic injection component to avoid warping, bending or twisting issues.
- f) Evaluation of techniques and assembly features in components to avoid or reduce assembly problems and to optimize the integration of fasteners.

4. Evaluation of plastic injection components for their release to texturing processes.

a) Visual evaluation of a component already injected in the "Beta" phase (Not salable), through the silver painting process, to detect issues of poor execution of the CAD file, which generates problems of sink marks on "A" surfaces, flow marks, turbulence or knit marks, excess of flash, etc; Or bad manufacturing of the tooling; Or wrong execution of the pressure / heat variables during the manufacturing process.

b) Component injection evaluation during Try-outs.

c) Knowledge of the texturing process by acid abrasion. This knowledge makes it possible to understand the different types of textures that may be applicable to the components, depending on their morphological architecture or their draft angle in critical regions, which allows specifying the technique of application of the texture, the texture itself and the level. Of texture wash-out certain texture needs in case its draft angle requirement exceeds the draft angle of the part.

5. Manufacturing of components in composite materials:

a) Manufacture of parts in GRP (Glass Fiber Reinforced Plastic), Carbon Fiber and Kevlar. I know the main processes for the design and manufacturing of components with composite materials:

- FG application by a spray gun and polyester and epoxy resins.
- Application of pre-impregnated woven fibers, cured at room temperature with auxiliary manual techniques and vacuum pumps to manufacture a single sheet membrane type.
- Application of pre-impregnated woven fibers with curing through autoclave with controlled suction pump.
- Construction of "sandwich" type composite materials with "Honey comb" type panels manufactured in an autoclave with controllable pressure and temperature for the development of ultralight components.
- Manufacture of PV or FC profiles by means of mechanical pultrusion manufacturing process using epoxy resins.

6. Transformation of thermoplastics and aluminum alloys by extrusion process.

I have the knowledge for the design and manufacture of profiles, moldings or pipes, which must be manufactured in a linear way for many different uses and assemblies.

7. Transformation of sheet metal.

- a) Sheet plate bending by Presbrake.
- b) Metaloflexia (bracket and component manufacturing process using laser cutting and bending of sheet metal) for the manufacture of supports, housings and metallic structures.
- c) Stamping and punching of steel and aluminum sheet metal.
- d) Forging of steel.

8. Manufacturing by foundry.

- a) Aluminum and Zamak die casting by open and closed cavity.
- b) Sand casting of steel, aluminum and copper.

9. Tubing bending process.

I have knowledge for the design and supervision of the manufacture of components that use bent tubular profiles, this knowledge allows me to design a component with the appropriate bend radii, depending on the thickness of the tube, the section of the tube and the gauge of the tube. I know the process of double 2D and 3D by CNC machinery.

10. Prototyping of models, physical mockups and prototypes: I know several techniques for the development of composed prototypes.

- a) Development of stereotomy to form three-dimensional models.
- b) CNC Milling machine process: Milling of polyurethane hard foam or wood by 3, 4, 5 and 6 axis Milling Machine
- c) Rapid prototyping: Powder printing, plastic 3D printing and stereo lithography by SLA and SLS.
- d) Machining of plastics and metals by means of a lathe and manual milling machine.
- e) Assembly of models, prototypes and simulators through the use of components manufactured by several prototyping techniques.

11. Welding metal processes: I know some welding techniques, how to apply them and how to develop assemblies to make the most optimal and effective assemblies using welds.

- a) Electric welding with electrode.
- b) MIG and TIG process welding process.

12. AMEF and PSWC: I am capable of submit a component under the Failure and Effect Mode Analysis, as well as create the Process Sequence Workflow Chart if necessary.



13. Finishing processes for plastic and metal components:

- a) Electrostatic micro-spray PU painting finishing process.
- b) Electrolytic adhesion processes such as: Metal plating, metal galvanization and aluminum anodization.
- c) Finishing process by sandblasting or "Sand-blastig"

14. Assembly and fastening techniques:

I have solid knowledge in diverse assembly techniques and devices for plastic and metal components, ranging from screw fasteners, rivets, snap-on or sliding fasteners, safety fasteners, noise and vibration isolation fasteners, and specialized adhesive methods that can range from high-strength double-adhesion tapes, to simple adhesives, by catalytic reaction, epoxy adhesives or adhesives and specialized formulation resins.

15. Structures and assemblies design.

I have knowledge for the development of tubular structures or frame designed under the metaloflexia technique (Laser Cutting of sheet and bending) or tubing profile welding. I know and use well the concepts of design by optimization of the MIE (Moment of inertia of a section) and the neutralization or favoring of bending, torsion or deformation effects by parallelogram, through the structural design by shear moment, bending moment and torsional moment. But also I know how to read FEA analysis made to understand the critical section of a component or frame.


16. DFMA Knowledge:



- a) Design for manufacturing (DFM). I develop the conceptualization of components considering the relevant and indicated manufacturing processes for each product and project.
- b) Design for assembly (DFA). I develop the design of products based on understanding the right assembly sequence, necessary to avoid interference or component matching problems in products that integrate various components by "poka-yoke" strategies or by dynamic visualization.
- c) Knowledge in design for assembly techniques for the development of correct gapping and matching between components, under processes of perceived appearance, such as designing by under or over flush surfacing to minimize of disharmonic effects in regions where more than two components converge.




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