

**U.S. – Morocco – Tunisia Workshop
on Entrepreneurship and Innovation
in Engineering Education
February 27 & 28, 2012**

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GUIDELINES

11:00 a.m. to 12:00 a.m. :

- 1. Economy, Knowledge, etc.**
- 2. Why innovate ?**
- 3. What is innovation ?**
- 4. How do innovators do?**
- 5. Forms of innovation**
- 6. "Miscellaneous"**
- 7. Summary & Questions**

Challenge for economic actors

Manage and orientate organisation :

- Match product et market,
- Fates of the enterprise and employees,
- Keep-up with technology evolution (equipement)



Challenges (continued)

Troubles don't come from a changing world

But :

because we try to manage future world with outdated rules of the game



2 – Why Innovate ?

- Create profitable "new"
- Take-up challenges
- Enhance the ideas of everybody
- Motivate teams
- Revitalize the management

*2/3 of growth
come from
innovation*

*Innovate to create
the différence*



2 – Why Innovate ?

Innovation : break-off the existing

- ◆ **"Intolerables"** : processus, functionings, practices... outdated, unacceptables and obviously prejudicials
- ◆ **dreams** : desired and beneficial changes

2 – Why Innovate ?

Breaking-off's

- ◆ **New products, services ou processes ...**
- ◆ **New uses of the same product or service**
- ◆ **New jobs in the same area**
- ◆ **New way to practice the job**
- ◆ **New practices**

2 – Why Innovate ?

Different situations

- ◆ **Survival (competitors)**
- ◆ **To be ahead (leader)**
- ◆ **Not to be caught up (corporate forecast)**
- ◆ **To keep lead (create the demand)**

3 – What is innovation ?

- To have an idea : **to imagine**
- Create / Invent :
- Innovate : **implementation, value creation**
- Cause a break-off : **change the model**

4 – How do innovators do?

- ◆ *The discoverer : Galileo*
- ◆ *The inventor : Leonardo da Vinci*
- ◆ *The innovator : Henry Ford*

4 – How do innovators do?

"Would you tell me, please, which way I ought to go from here?"

"That depends a good deal on where you want to get to," said the Cat.

"I don't much care where--" said Alice.

"Then it doesn't matter which way you go," said the Cat.

"--so long as I get SOMEWHERE," Alice added as an explanation.

"Oh, you're sure to do that," said the Cat, "if you only walk long enough."

4 – How do innovators do?

- ◆ *Information gathering*
- ◆ *Formalization : writing, drawings, calculations*
- ◆ *Implementation & tests : models, experiments, prototypes*

5 – Forms of innovation

- *Provoked (Caused):*
- *Spontaneous:*

5 – Forms of innovation

- *Breaking-off*
 - **Change of model**
 - **Aims significant differences**

- *Incremental:*
 - **Modify an existing element, component, ...**
 - **Create sthg new on the existing**

5 – Forms of innovation

- *Technical*

- **Technology, engineering**
- **Products**

- *Any areas:*

- **Services, organization, communication, etc.**

5 – Forms of innovation

■ *Institutional*

- **Research & Development**
- **Marketing**
- **Engineering**

■ *Participative*

- **All employees**
- **Cross-functional Groups**

5 – Forms of innovation

■ *Strategic*

- **Concerns the whole company**
- **Top Management**

■ *Local*

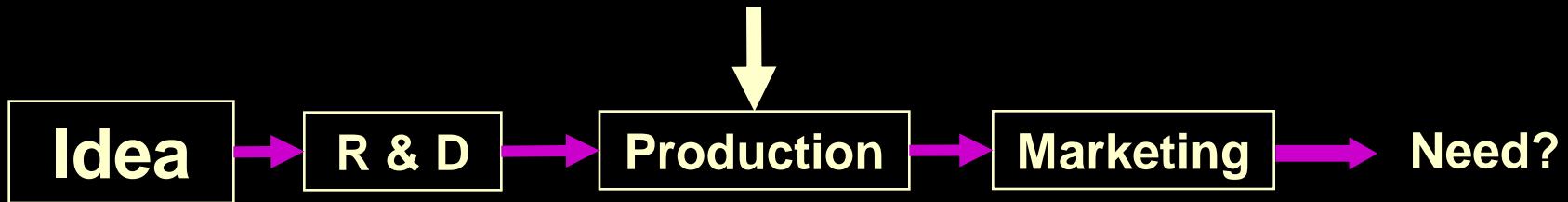
- **A local unit**
- **Managed by local operation**

Innovation : tentative définition

- Any process of change which makes the company know-hows evolve toward a more competitive position
- The point is to create the difference to get the preference

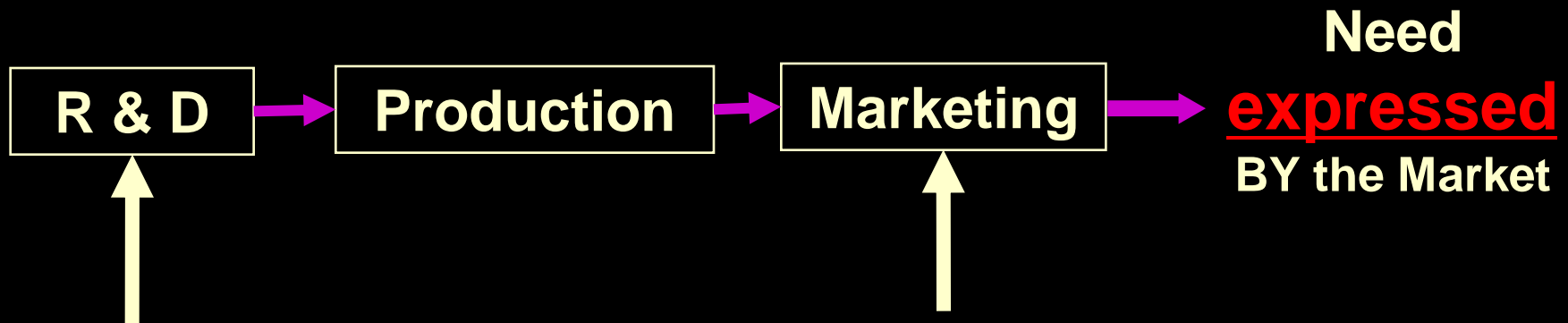
Innovation Models

Technology push



Innovation Models

Market pull



Creativity techniques



Aerodynamically, the bumble bee shouldn't be able to fly, but the bumble bee doesn't know it so it goes on flying anyway.

Mary Kay Ash



Quality : "NTQM"

- The **New Total Quality Management** is an "evolution" of Total Quality Management aimed to meet new customers needs :

-

"Everything, now, anytime, anywhere, perfect and at minimum cost"

**How and where to
find ideas ?**

CONTEXT

**History, Culture, Society, Technology,
Economy, Industry, Market, ...**

21st Century Entrepreneur & Challenges

A challenge = opportunity (ies)

21st Century Challenges

- **Demography**
 - ◆ **Fall in birth rate in developed countries**
 - ◆ **High birth rates in LDC**
- **Economic interdependence of national economies**
 - ◆ **"Globalization"**
 - ◆ **Financialization of the economy**
- **Modification of equilibria "Nations – Enterprises"**

21st Century Challenges

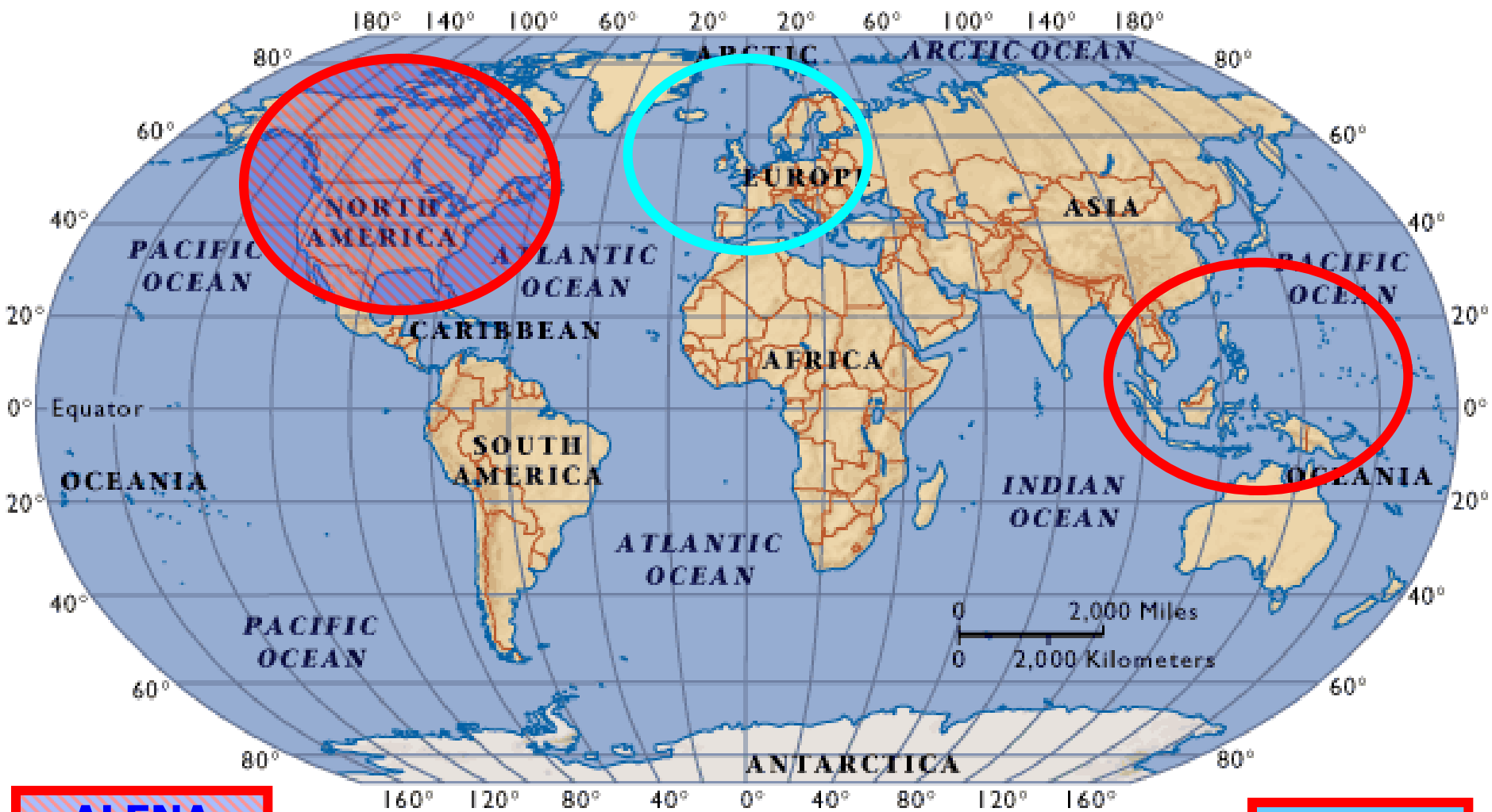
- **Increased prevalence of knowledge economy**
 - ◆ Higher education
 - ◆ R & D
 - ◆ Obsolescence momentum

21st Century Challenges

- Depletion of natural resources
 - ◆ Water
 - ◆ Energy
 - ◆ Air (!)
 - ◆ ...
- Les grands défis vis-à-vis de l'humanité en général
 - ◆ Healthcare
 - ◆ Illiteracy
 - ◆ Poverty
 - ◆ Unemployment

Sustainable development

The World



ALENA

EEE

ALEA

Créer et Innover

Définitions

Innovation

Processus suivant lequel de nouveaux avantages économiques et sociaux sont extraits du savoir (d'après la définition de l'OCDE)

Processus d'émulation visant la reconfiguration du savoir existant

Innover :

Développer ou améliorer des produits et procédés

Innovation = Compétence + Créativité

Créer et Innover

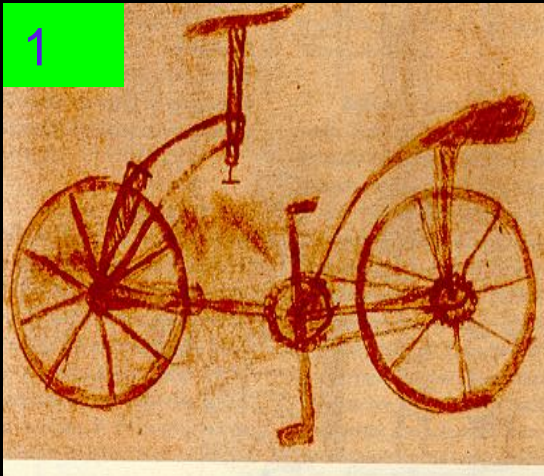
Invention et innovation

300 ans pour passer de l'invention à l'innovation de la bicyclette

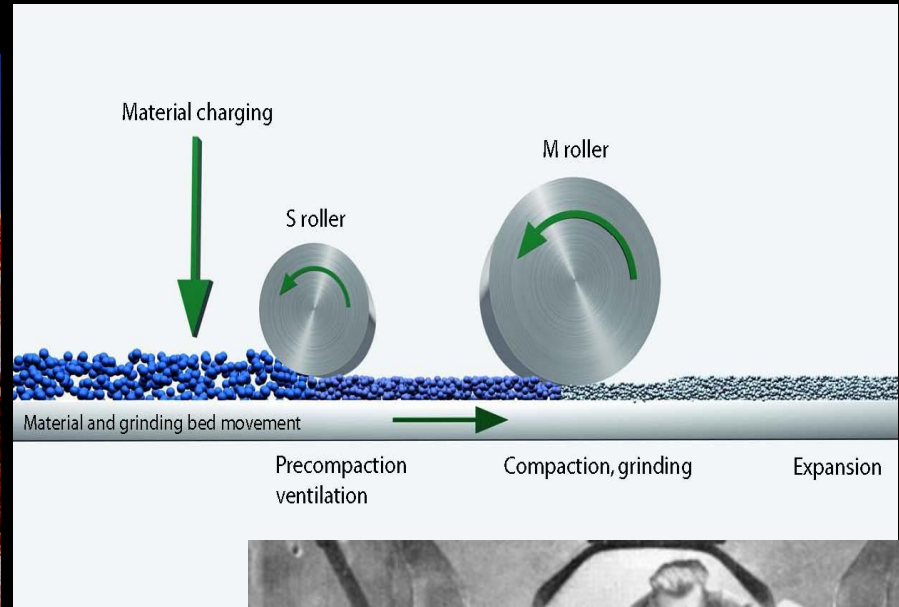
Le vélo de Léonard de Vinci (environ 1500)

La draisienne (Von Drais, 1818)

Le hobby horse et le dandy horse (Johnson, 1818)



Wheels of mill



Les Étapes de la Créativité

■ Les 4 étapes de la créativité :

- ◆ Préparation

- ◆ Incubation

- ◆ Illumination

- ◆ Vérification

- *Henri Poincaré (« Science et Méthode », 1908)*

Techniques de créativité

Deuxième principe

- Plus le cheminement dans la recherche d'une idée d'entreprendre sera :

long sinuous arborescent alluvial

- Plus

le résultat sera fertile

Techniques de créativité

Création en groupe

- **Seuil de criticité :**
 - ◆ Une idée = une idée
 - ◆ 10 idées = 100 idées
- **Un groupe provoque la réaction en chaîne :**
 - ◆ Recherchez la présence de personnes créatives
 - ◆ Mettez les en état créatif :
 - Disponibilité
 - Cadre de travail
 - Relations interpersonnelles
- **Fonctionnement :**
 - ◆ Les idées n'appartiennent à personne
 - ◆ Donner ses idées est utile
 - ◆ Copier celles des autres est recommandé

Techniques de créativité

Création en groupe

■ Enjeu :

- ◆ le plaisir de découvrir ensemble
- ◆ Pas de compétition mais :
- ◆ Obligation de moyens :
 - pas d'obligation de résultats

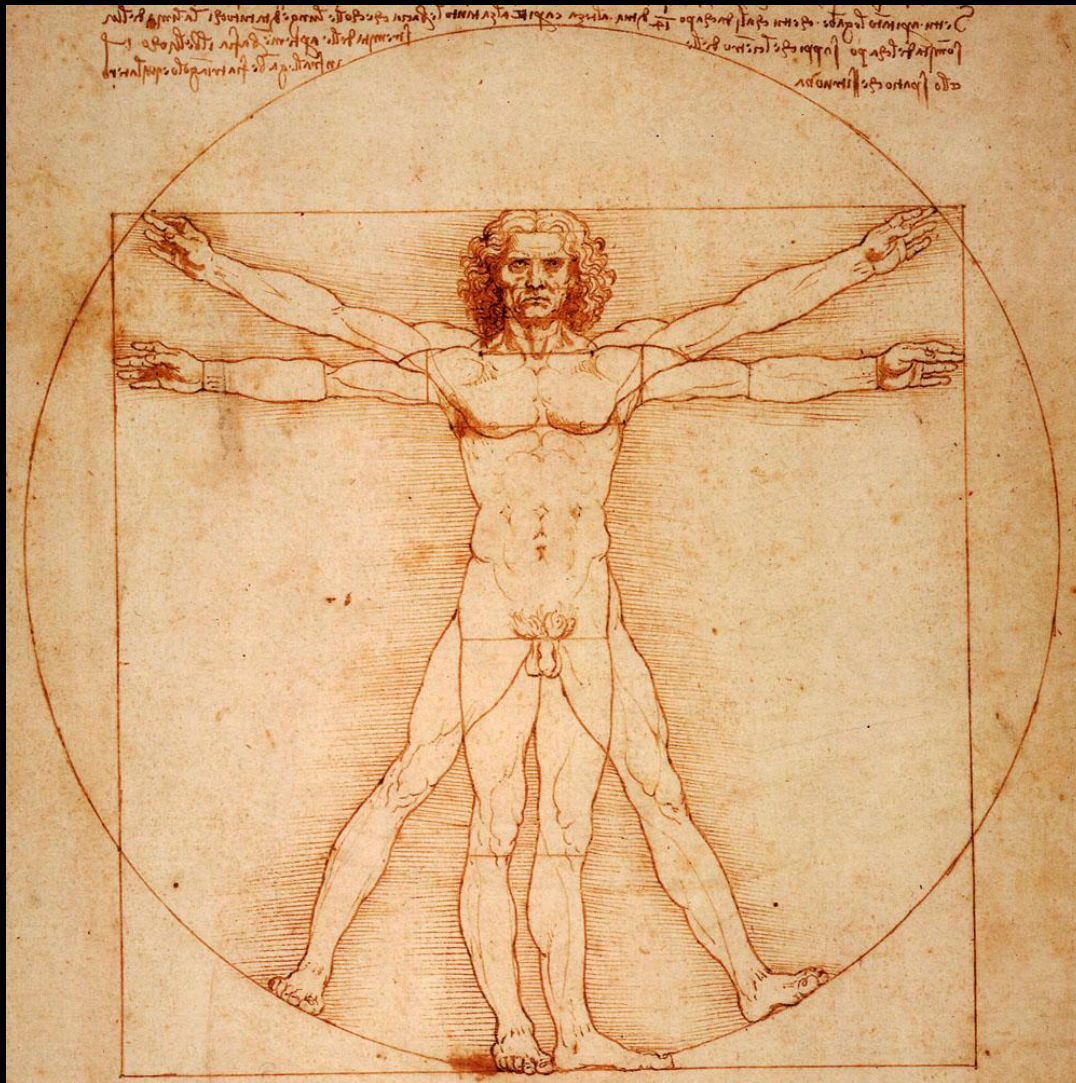
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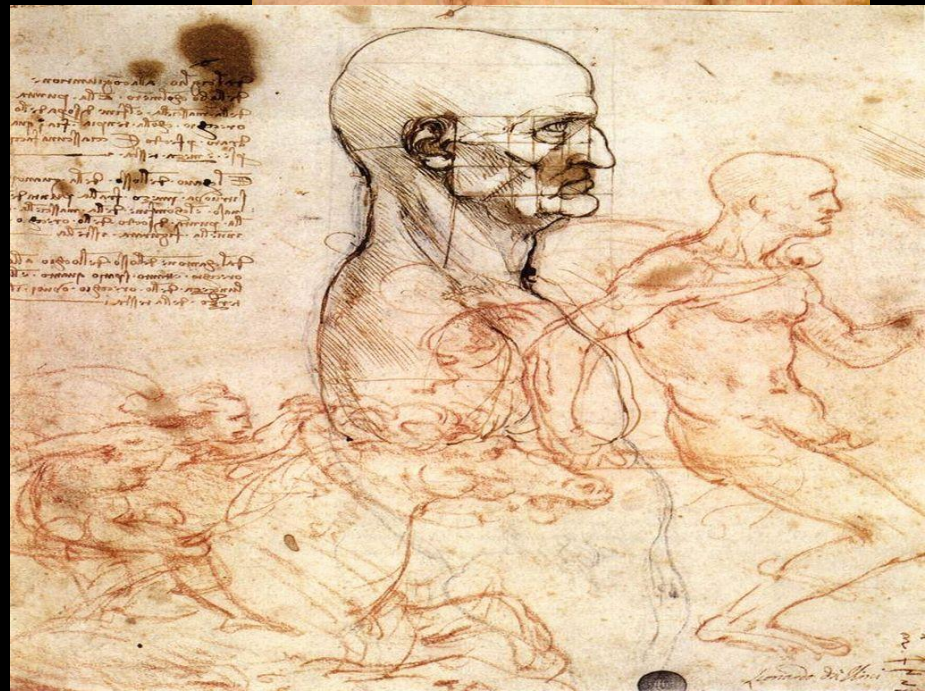
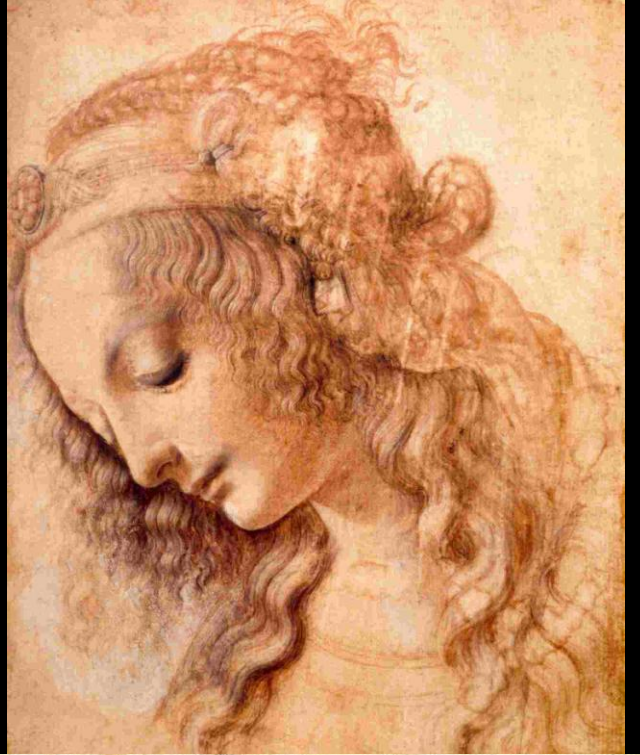
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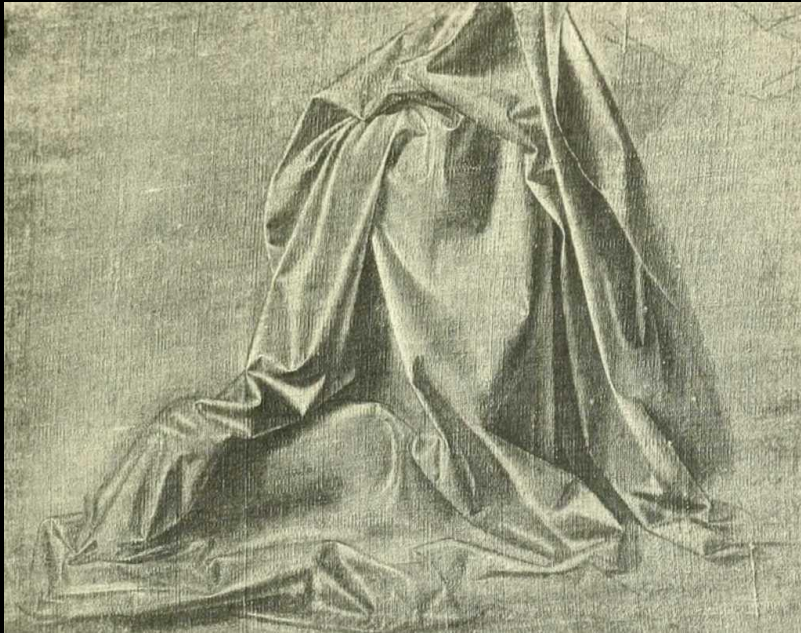
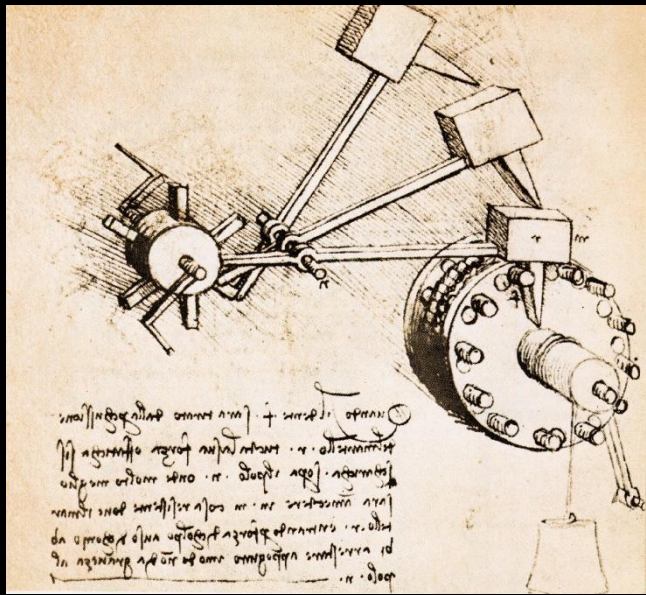
Julius H. Comroe :

**To look for a needle in a haystack
and get out of it with the farmer's
daughter.**

Leonardo Da Vinci seven steps to genius







1. Curiosita

An insatiably curious approach to life and unrelenting quest for continuous learning.

2. Dimostrazione

It is a commitment to test knowledge through experience, persistence, and a willingness to learn from mistake.

3. Sensazione

The continual refinement of the senses, especially sight, as the means to enliven experience. (Saper vedere, knowing how to see)

4. Sfumato

A willingness to embrace ambiguity, paradox, and uncertainty (a critical characteristic of Leonardo's genius).

5. Arte/scienza

Arte/scienza is the development of the balance between science and art, logic and imagination. It is “whole-brain” thinking.

Learn the rules of mind-mapping

6. Corporalita

Corporalita is *the cultivation of grace, ambidexterity, fitness, and poise.*

7. Connessione

A recognition of and appreciation for the interconnectedness of all things and phenomena.

Quotations

**If you want to make enemies, try to change something.
(Woodrow WILSON)**

**" You don't wait for the future like you wait for
a train, you make the future !!" (Georges BERNANOS)**

**It's not water but people who makes the difference between
a desert and a garden (a Vegas proverb)**

Conclusion

■ Last word

If somebody has recognized a problem and is not doing something about it, he becomes himself a part of the problem

(Indian proverb)

*I can't decide between innovate
and get it wrong, or do nothing
and disappear .*



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Thank you !