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# **PRESENTING AND COMMUNICATING STATISTICS: PRINCIPLES, COMPONENTS, AND THEIR QUALITY ASSESSMENT. A PROPOSAL**

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1. Communication: integral component of statistical work

2. Communicating statistics

3. Assessing statistical communication

4. The way forward



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# *a formula...*



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$$\mathbf{VAS = N * [(QSA * MF) * RS * TS * NL]} \rightarrow \mathbf{Giovannini, 2008}$$

This detailed formula, including many relevant aspects like the role of media and users' numeracy, can be reconsidered by including also aspects concerning "quality" e "incisiveness" of the message:

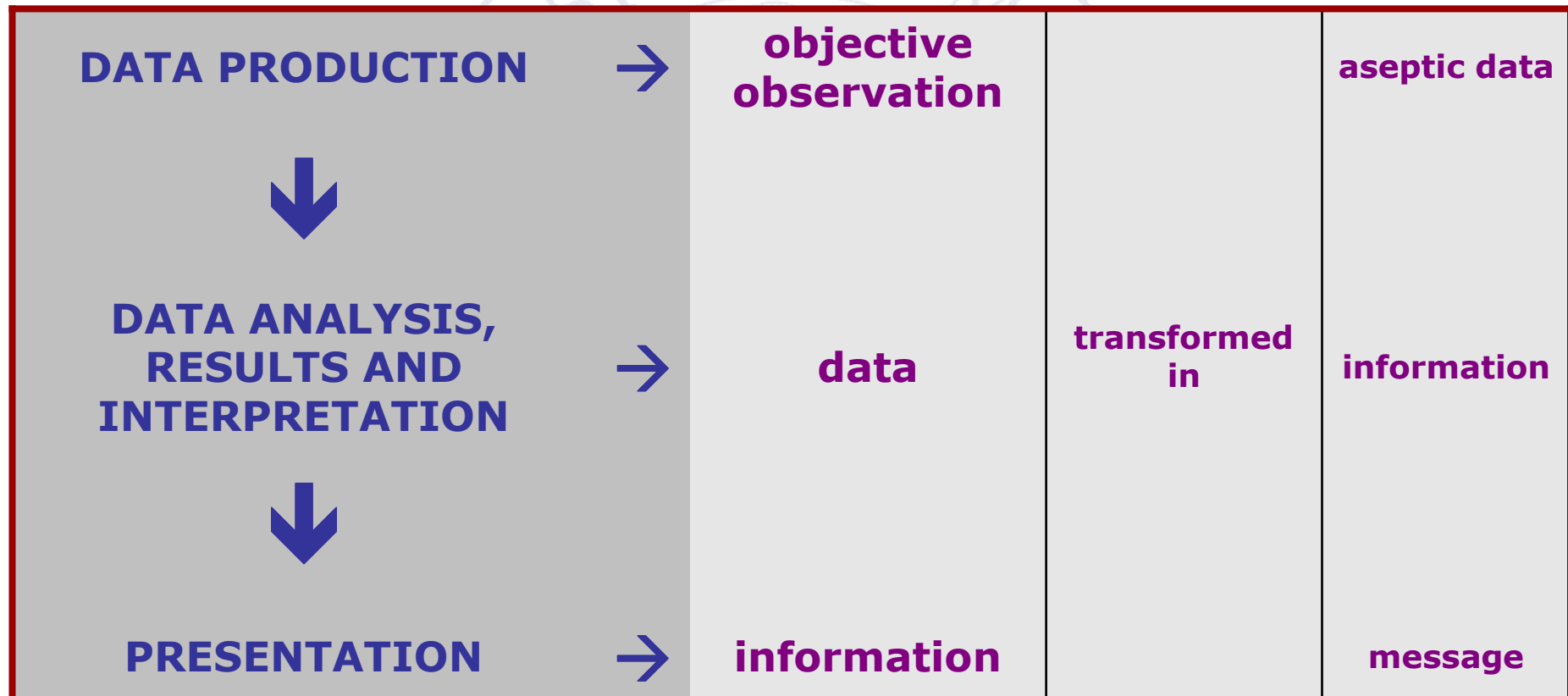
$$\mathbf{VAS = f ( N, QSA, MF, RS, TS, NL, \underline{QIP} )} \rightarrow \mathbf{additional\ component}$$

<b>VAS</b>	Value added of official statistics
<b>N</b>	Size of the audience
<b>QSA</b>	Statistical information produced
<b>MF</b>	Role of media
<b>RS</b>	Relevance of the statistical information
<b>TS</b>	Trust in official statistics
<b>NL</b>	Users' "numeracy"
<b>QIP</b>	Quality and incisiveness of presentation



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# COMMUNICATION IN STATISTICS: FROM DATA TO MESSAGE





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# 1. FUNDAMENTAL ASPECTS



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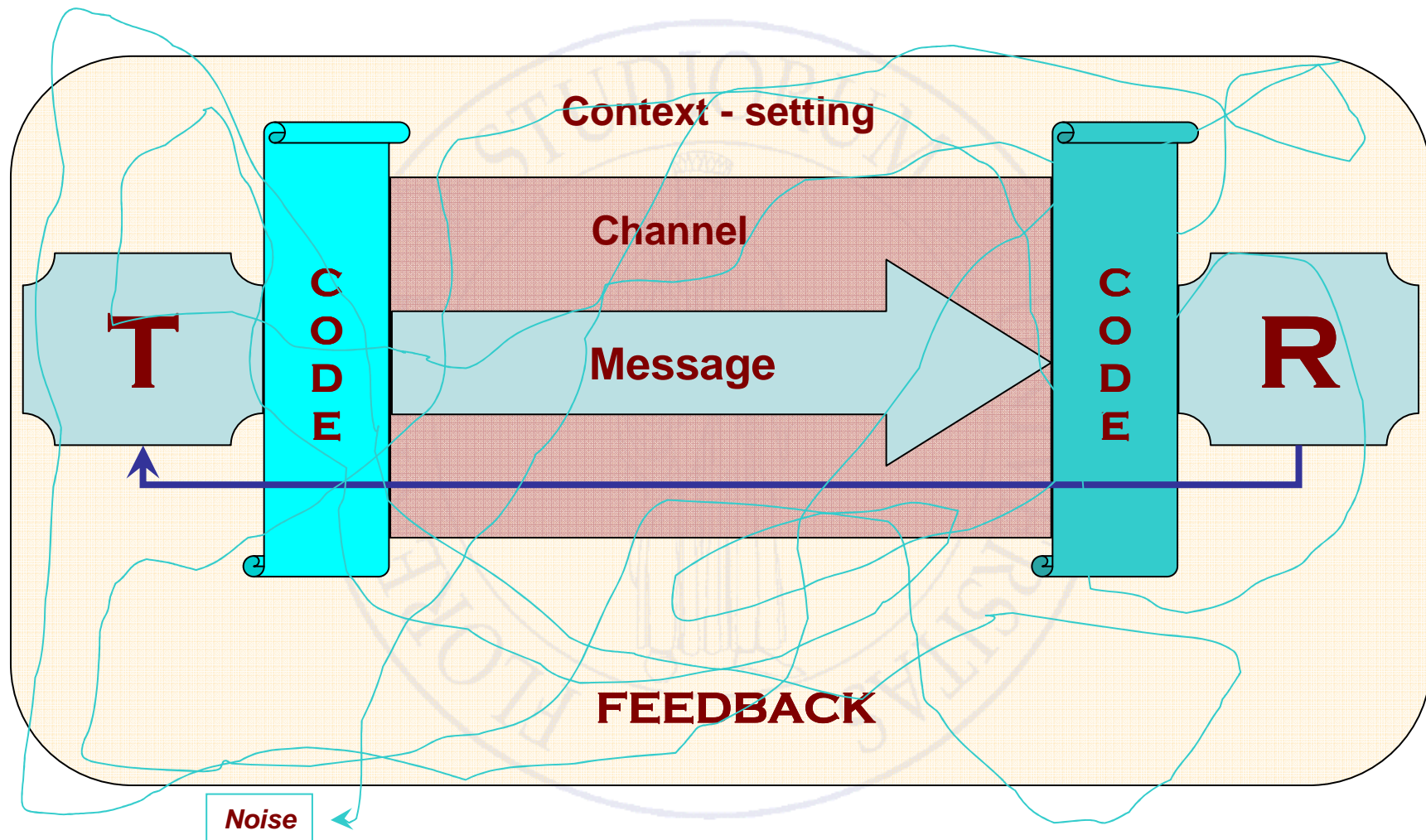
<b>Aspects of statistical presentations</b>	<b>Corresponding discipline</b>
<b>Content</b>	<b>Ethics</b>
<b>Appeal</b>	<b>Aesthetics</b>
<b>Persuasion</b>	<b>Rhetoric</b>
	<b>↓</b> <b>Theory of presentation</b>



## 2. MAIN COMPONENTS



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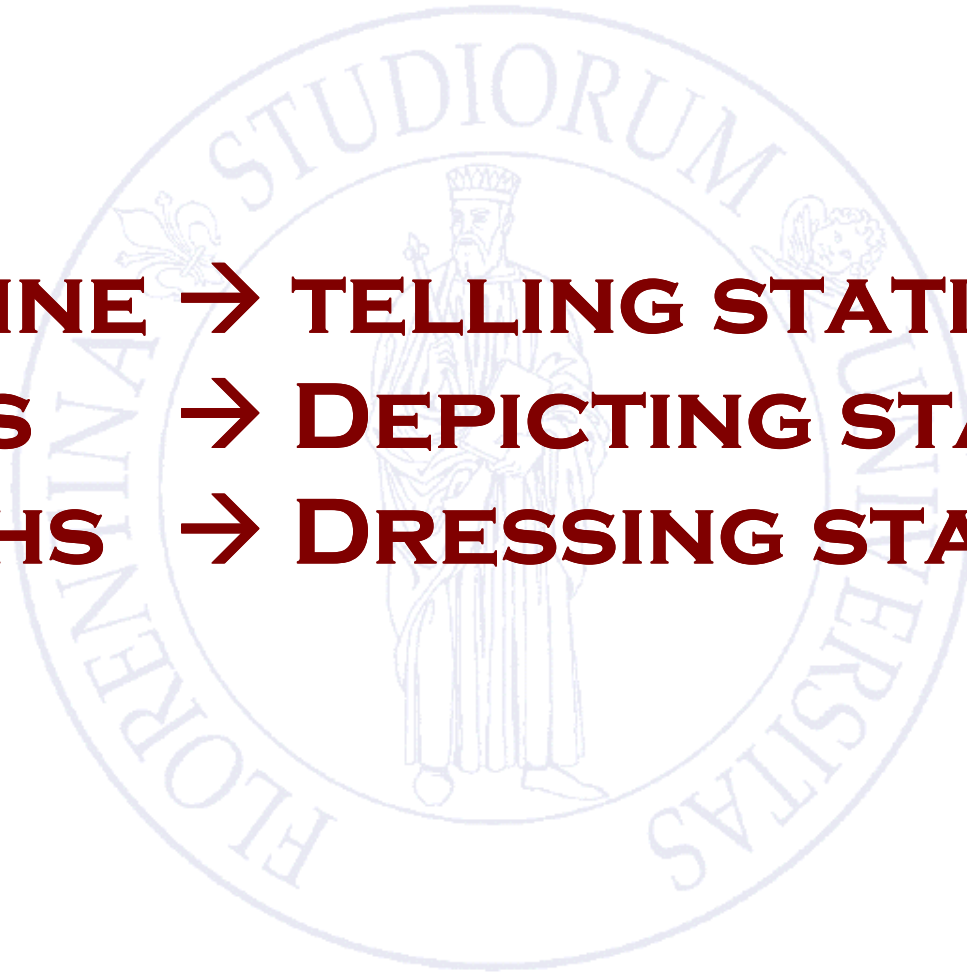
## 3. CODES



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### IN STATISTICAL COMMUNICATION

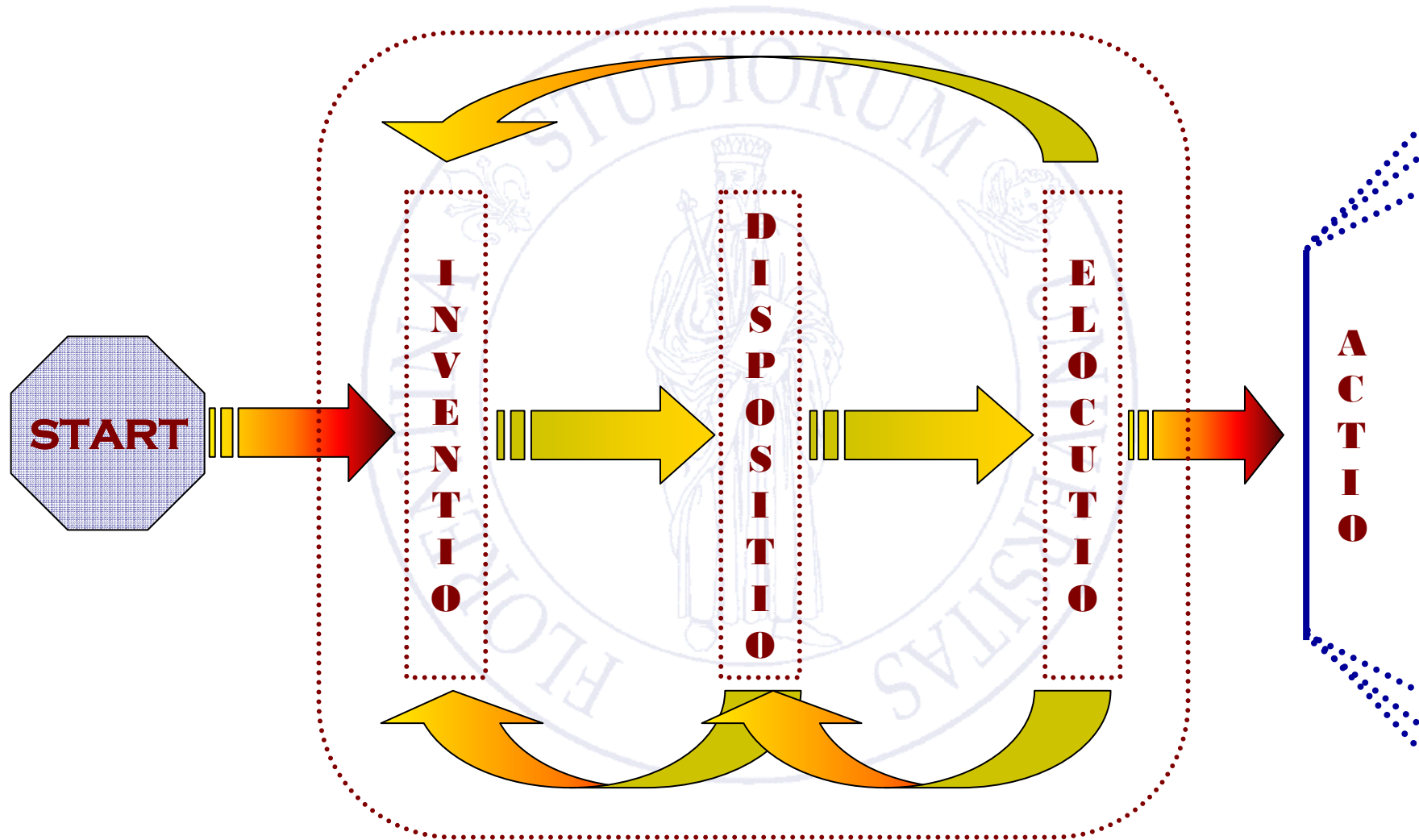
- A. OUTLINE → TELLING STATISTICS**
- B. TOOLS → DEPICTING STATISTICS**
- C. CLOTHS → DRESSING STATISTICS**





# 3A. OUTLINE → TELLING STATISTICS

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## 3A. OUTLINE → TELLING STATISTICS

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### 1- *INVENTIO* (INVENTION)

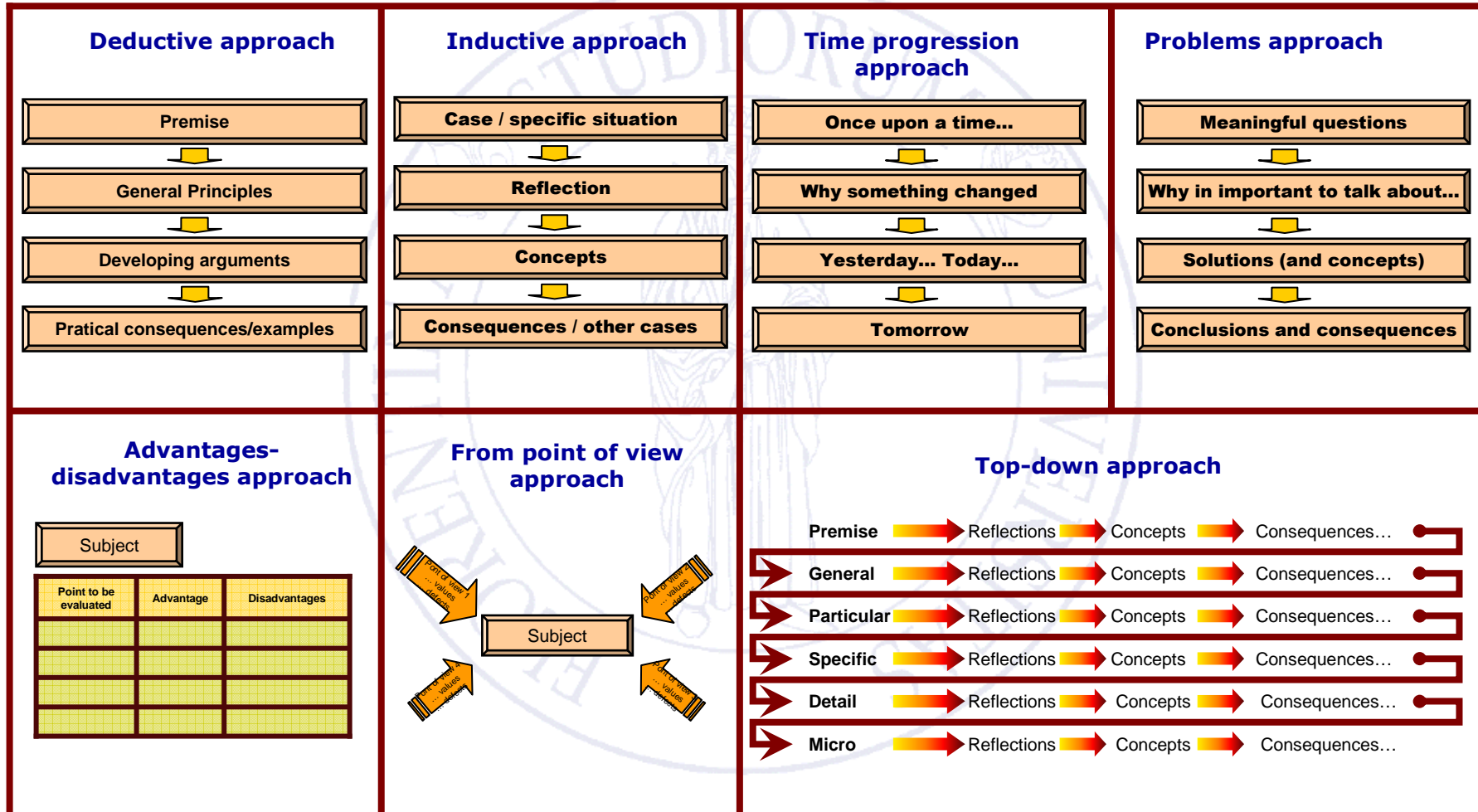
- **Who** → the subject of telling
- **What** → the fact
- **When** → the time location
- **Where** → the field location
- **Why** → the causes



# 3A. OUTLINE → TELLING STATISTICS

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## 2- DISPOSITIO (LAYOUT)





## 3A. OUTLINE → TELLING STATISTICS

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### 3- *ELOCUTIO* (EXPRESSION)

Figures of	Definition
Thinking	change in words' or propositions' invention and imaginative shape
Meaning (or tropes)	change in words' meaning
Diction	change in words' shape
Elocution	choice of the most suitable or convenient words
Construction	change in words' order inside a sentence
Rhythm	phonic effects



## 3A. OUTLINE → TELLING STATISTICS

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### 4- *ACTIO* (EXECUTION)

#### Stages:

1. Introduction
2. Development
3. Comments
4. Time/space use
5. Ending
6. Receivers' feedback (Q&A)



## 3B. TOOLS → DEPICTING STATISTICS

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### **FUNCTIONS**

**Supporting attention**

**Activating and building prior knowledge**

**Minimizing cognitive load**

**Building mental models**

**Supporting transfer of learning**

**Supporting motivation**



## **3B. TOOLS → DEPICTING STATISTICS**

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# **PERCEPTION OF STATISTICAL GRAPH**

**Recognizing the code**  
**Recognizing regularities**  
**Carrying out comparisons and identify differences**





## 3B. TOOLS → DEPICTING STATISTICS

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### GRAPH PRINCIPLES

Categories		Principles
<b>Connect with the audience</b>	<b>Message should connect with the goals and interests of your audience.</b>	<b>Relevance</b>
		<b>Appropriate knowledge</b>
<b>Direct and hold attention</b>	<b>Presentation should lead the audience to pay attention to what is important.</b>	<b>Saliency</b>
		<b>Discriminability</b>
		<b>Perceptual organization</b>
<b>Promote understanding and memory</b>	<b>Presentation should be easy to follow, digest, and remember.</b>	<b>Compatibility</b>
		<b>Information changes</b>
		<b>Capacity limitations</b>



## 3B. TOOLS → DEPICTING STATISTICS

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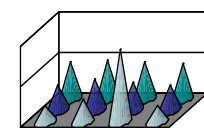
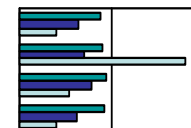
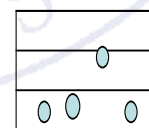
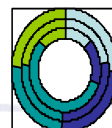
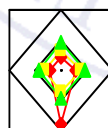
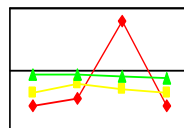
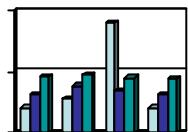
### (I) CHOOSING A GRAPH ...

... by taking into account

- number of involved variables
- nature of data (level of measurement)
- statistical information to be represented

... by preferring

- a simple graph with reference to the audience
- a clear graph instead of an attractive one
- a correct graph with reference to data





## 3B. TOOLS → DEPICTING STATISTICS

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### (II) PREPARING A GRAPH

<b>Scale definition</b>	<b>correctly defining and showing scale/s</b>
<b>Dimensionality</b>	<b>reducing dimensionality as much as possible by showing few variables for each graph using no meaningless axis</b>
<b>Colours as statistical codes</b>	<b>using colours consistently with statistical information</b>
<b>Rounding off values</b>	<b>rounding up and down through standard criteria</b>
<b>Dynamics presentation</b>	<b>dynamic perspective should reflect a dynamic phenomenon</b>
<b>Legibility</b>	<b>few elements as possible. Wise use of legends and captions</b>



## 3C. CLOTHS → DRESSING STATISTICS

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**Different aspects:**

- **Text arrangement**
- **Characters and fonts**
- **Colours**
- **Other aspect**

**With reference to:**

- **Balance**
- **Harmony**
- **Proportion**
- **Elegance**
- **Style**



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# 1. CONCEPTUAL FRAMEWORK

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## ASPECTS ALLOWING THE ASSESSING

- 1.1 THE DIMENSIONS TO EVALUATE**
- 1.2 THE EVALUATING CRITERIA**
- 1.3 THE COMPONENTS OF THE TRANSMISSION PROCESS**



# 1. CONCEPTUAL FRAMEWORK

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## 1.1 THE DIMENSIONS TO EVALUATE

- (I) **OUTLINE**
- (II) **TOOLS**
- (III) **CLOTHS**



# 1. CONCEPTUAL FRAMEWORK

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## 1.2 THE EVALUATING CRITERIA

- (A) SUITABILITY / CONSISTENCY**
- (B) CORRECTNESS**
- (C) CLARITY**





# 1. CONCEPTUAL FRAMEWORK

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## 1.3 THE COMPONENTS OF THE TRANSMISSION PROCESS

- **RECEIVER / AUDIENCE**
- **AVAILABLE CHANNEL**
- **AVAILABLE CONTEXT / SETTING**
- **MESSAGE'S CONTENTS**



# 1. CONCEPTUAL FRAMEWORK

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<b>(i) Audience</b>	<ul style="list-style-type: none"><li>- experts</li><li>- politicians and policy makers</li><li>- students</li><li>- statistical data users</li><li>- not specialized</li></ul>
<b>(ii) Channel</b>	<ul style="list-style-type: none"><li>- auditory channel ("listening", requiring oral explanation)</li><li>- visual channel ("looking", requiring explicative slides)</li><li>- kinetic channel ("doing", requiring practical exercises)</li></ul>
<b>(iii) Context</b>	<ul style="list-style-type: none"><li>- occasions (seminars, conferences, meetings, press conferences, ...)</li><li>- settings (rooms, tables, ...)</li></ul>





## 2. NEED OF STANDARDIZED CODES

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**Communication of statistics needs to be assessed through standardized methods and techniques in order to improve its impact**

**Developing and adopting standardized codes allow transmitters to warrant:**

<b><i>objectivity</i></b>	<b>of data presentation, by avoiding introduction of any subjective component</b>
<b><i>comparability</i></b>	<b>between different presentations and along time,</b>
<b><i>economicity and efficiency</i></b>	<b>in preparing presentation,</b>
<b><i>generalization</i></b>	<b>by avoiding any kind of "adaptability" of codes to "subjective" messages,</b>
<b><i>understanding</i></b>	<b>of data structure.</b>



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# THE WAY FORWARD ...



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**Emphasizing communicative aspects does not aim at exasperating the importance of communication with respect to the rest of statistical activities.**

**ICT societies increasingly require statistical information.**

**In order to attribute more value to statistics and to increase impact of statistics on reality, two processes need to be assessed:**

- **data production and analysis**
- **communication**



# THE WAY FORWARD ...



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**The presented work summarizes the first stage of our study, aimed at defining the framework for quality assessment of communication in statistics.**

**The goal is to define the assessment technology by discussing with all the willing colleagues.**



# THE WAY FORWARD ...



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To be continued... JOIN US!

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