Center for Nondestructive Diagnostics of Technological Processes
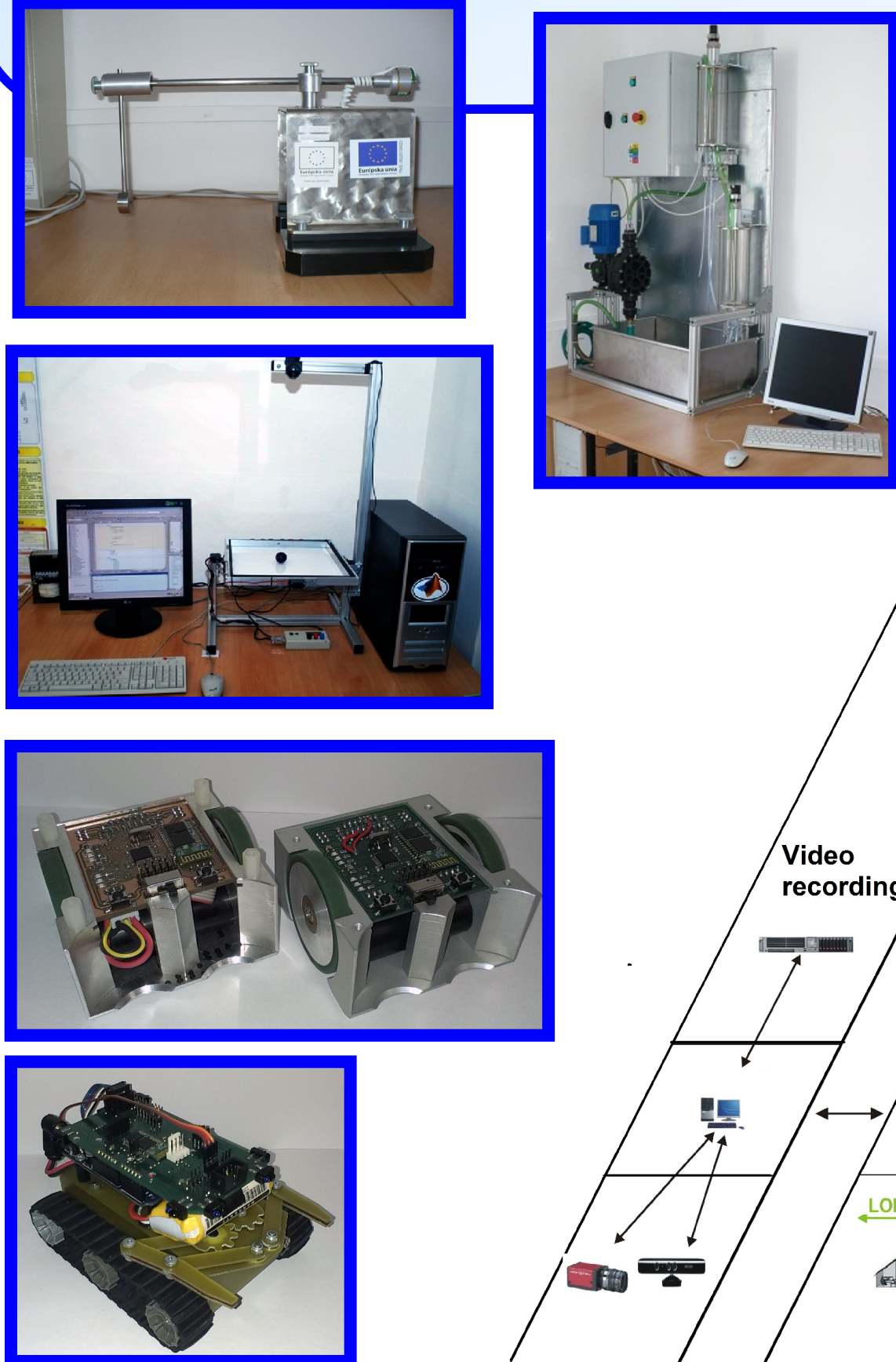
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Abstract – Center for Nondestructive Diagnostics of Technological Processes is implemented within the **TECHNICOM** project at the Technical University of Košice in accordance with the project's intention to improve conditions for getting research results into practice. The focus of the Center's research is on nondestructive, contactless diagnostics of technological processes relying on image recognition systems where images are scanned by means of *contact-free characteristics scanning* through grayscale, color or thermovision cameras. This equipment is integrated into the control systems of technological processes and interconnected with the mechatronic parts of technological devices or production lines such as servo systems, mobile and manipulator robots. Our project therefore involves a wide range of technical, programming and networking resources which allow the development, experimental verification and adjustment of solutions related to monitoring, diagnostics and control of technological processes. Hardware and software aspects of applications covering the areas of interest of the Center (**camera systems**, **mechatronic systems**, **flexible manufacturing systems**, **diagnostic systems**) are implemented as independent modules and included in the control and information system of a technological process using standard interfaces. All steps of the control system design process correspond to the specific level of the proprietary **five-level pyramid scheme of a distributed control system**, described in more detail at **http://kyb.fei.tuke.sk/**. Cooperation is encouraged in the areas of development and application of single-purpose devices and equipment for solving complex measurement, diagnostics and control tasks implemented either as local applications communicating with the master system, or as an integrated part of a control system.
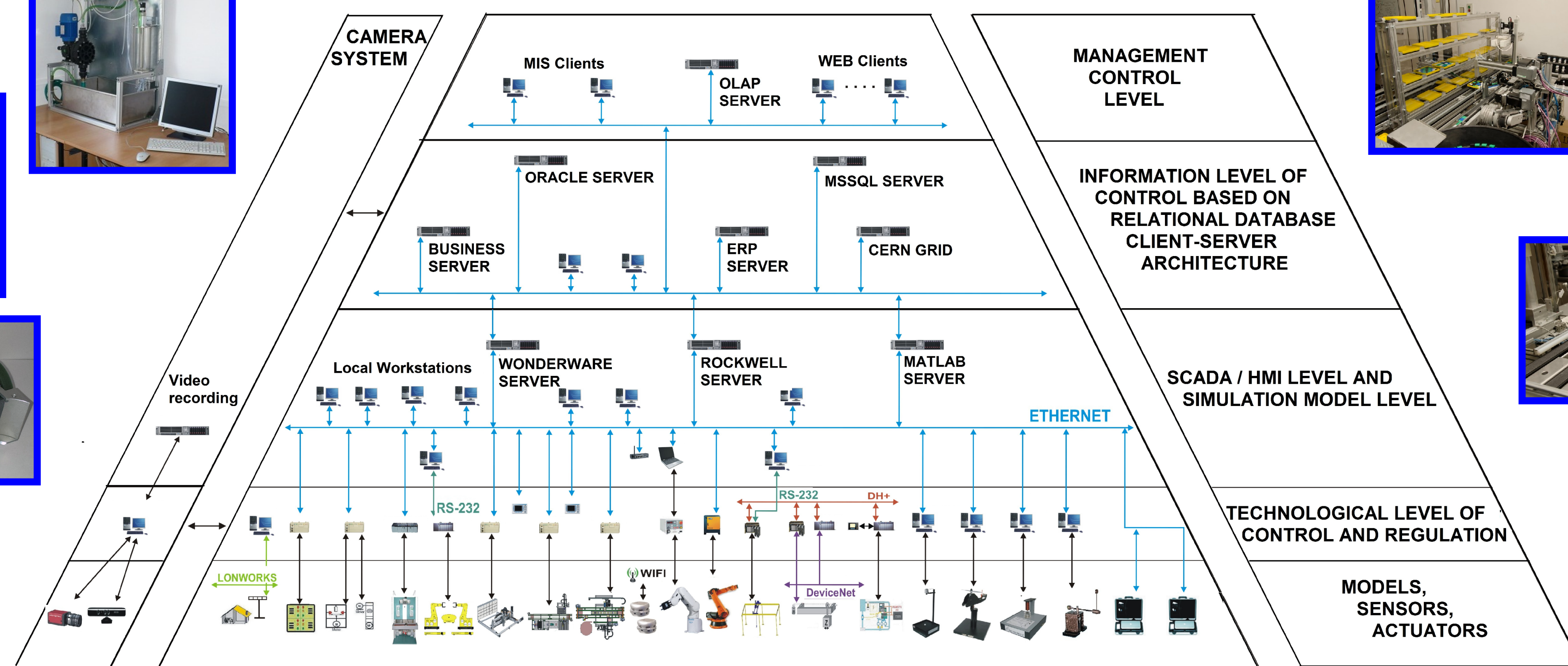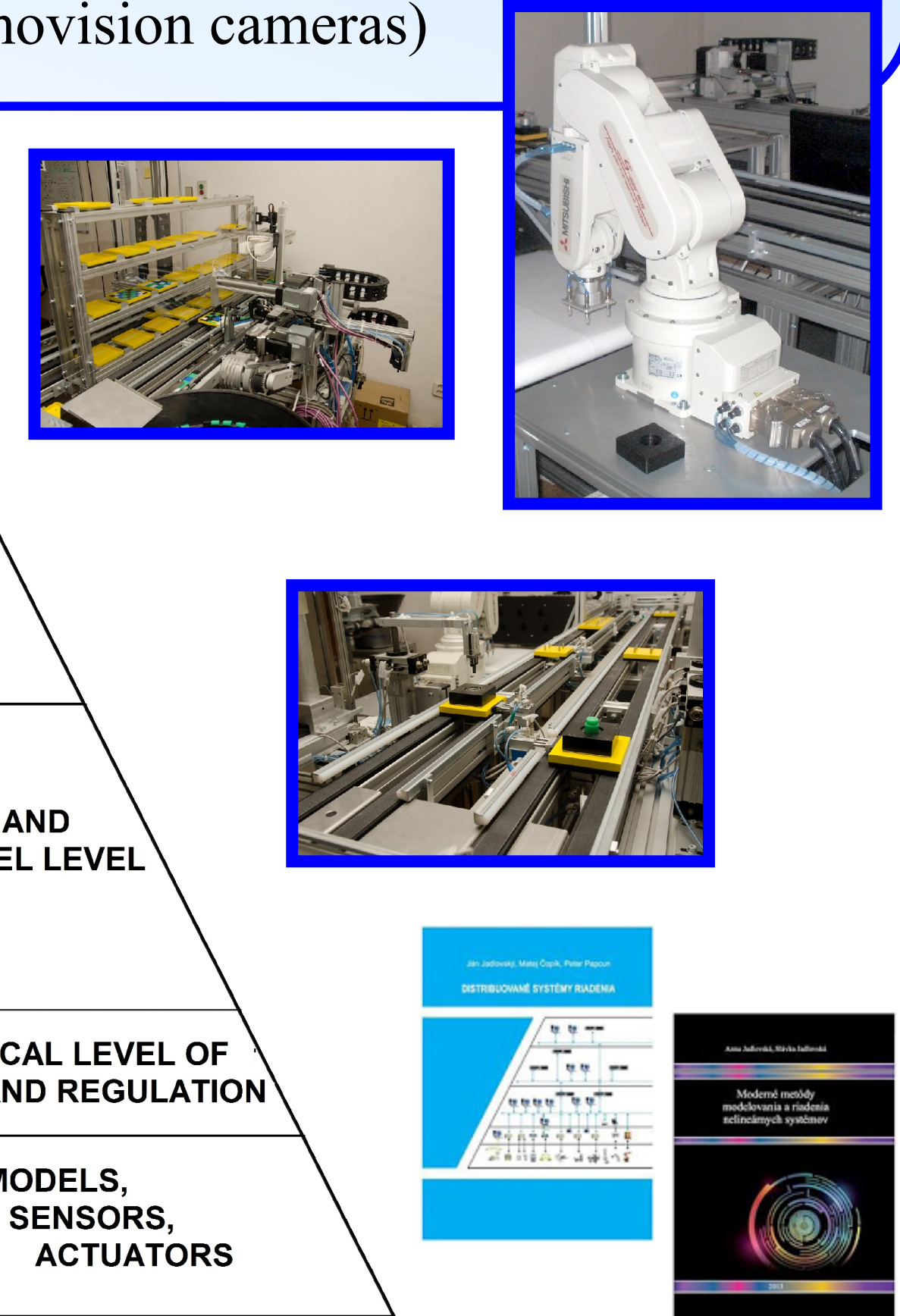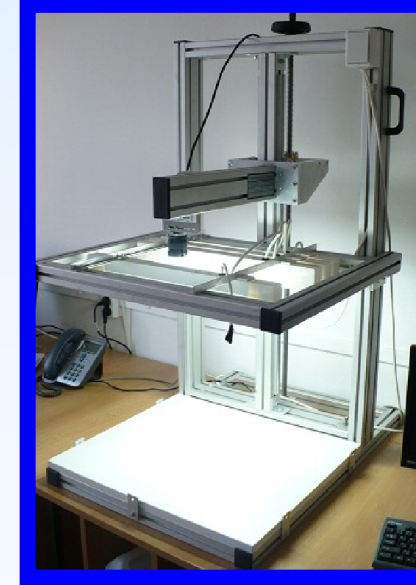
Mechatronic systems I.
- modeling (analytical/experimental identification), control and diagnostics of **underactuated** & **fully actuated** mechatronic systems using classical and artificial intelligence methods
- design of **diagnostic systems** for the diagnostics of vibration and jitter in mechatronic systems

Flexible manufacturing systems
- design, mechanical/electrical/program implementation, modeling and simulation, control, diagnostics and optimization of **automated production lines** at all levels
- monitoring and diagnostics of devices and processes based on dimensional parameter measurement using **camera systems** (surface and line cameras, thermovision cameras)

Mechatronic systems II.
- design, development and application of **mobile robots**
- implementation of sensors/actuators and their application under special conditions
- design and implementation of specialized mobile robotic workplaces equipped with **camera systems** to allow space perception

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KKUI
Katedra kybernetiky
a umelej inteligencie

CAK
Centrum aplikovanej kybernetiky

Európska únia
Európsky fond regionálneho rozvoja

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