

# MCP Come Modello Architeturale. Dal Tool Calling ai Sistemi Autonomi



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Cos'è un MCP?



## Model Context Protocol.

Uno standard aperto che offre ai modelli di IA un unico metodo coerente per connettersi a strumenti, database e sistemi esterni.



# RESOURCES

INFORMATION & KNOWLEDGE

RESOURCES PROVIDE CONTEXT, DATA AND DOMAIN KNOWLEDGE.



READ-ONLY KNOWLEDGE

USED BY AGENTS TO UNDERSTAND THE WORLD.

CUSTOMER CATALOG



PRODUCT CATALOG



INVENTORY DATA



SKU	LOCATION	QTY
A101	WH02	320
B205	WH01	150
C309	WH03	85

SALES HISTORY



PRICING GUIDELINES



SUPPLIER INFORMATION



RESOURCE TYPES

- DOCUMENTS
- DATABASES
- FILES
- APIS
- KNOWLEDGE BASES

DOMAIN MODELS

BUSINESS RULES

POLICIES

REFERENCE DATA

KNOWLEDGE IS CONTEXT.  
CONTEXT DRIVES INTELLIGENCE.

INVENTORY

WAREHOUSES

SUPPLIERS

SHIPMENTS

RETURNS

CUSTOMERS

ORDERS

PRICING

FORECASTS

# TOOLS

## ACTIONS & CAPABILITIES

TOOLS ARE EXECUTABLE CAPABILITIES THAT AGENTS CAN USE TO INTERACT WITH THE WORLD AND TAKE ACTION.

- ⚡ EXECUTE ACTIONS
- 🎯 CALL SERVICES
- ⚙️ MODIFY SYSTEMS
- 📦 CREATE & UPDATE
- 🛡️ VALIDATE & CHECK

### SEARCH ORDERS

Find and retrieve orders by filters  
GET /orders

### CREATE SHIPMENT

Create a new shipment  
POST /shipments

### CHECK INVENTORY

Check stock availability  
GET /inventory

### GENERATE FORECAST

Generate sales forecast  
POST /forecast

### CREATE ORDER

Create a new customer order  
POST /orders

### SEND EMAIL

Send email to a customer  
POST /email

### UPDATE ORDER

Update order details  
PUT /orders/{id}

### CALCULATE PRICE

Calculate pricing and discounts  
POST /pricing

### CHECK CREDIT

Check customer credit status  
GET /credit/{id}

CAPABILITIES  
TURN INTENT  
INTO ACTION.

### TOOL EXECUTION

INTENT → TOOL → RESULT

SEARCH

QUERY

CREATE

UPDATE

UPDATE

DELETE

VALIDATE

EXECUTE

# PROMPTS

## INSTRUCTIONS & REASONING

PROMPTS DEFINE HOW AGENTS THINK, REASON AND STRUCTURE THEIR WORK.

THEY GUIDE BEHAVIOR, ENSURE CONSISTENCY AND ENCODE BEST PRACTICES.

- SYSTEM PROMPTS
- TASK TEMPLATES
- DOMAIN RULES
- WORKFLOWS
- BEST PRACTICES



### SALES ANALYSIS TEMPLATE

- Objective
- Inputs
- Steps
- Output Format



### CUSTOMER RESPONSE GUIDELINES

- Tone
- Empathy
- Clarity
- Resolution



### PRICING STRATEGY FRAMEWORK

- Context
- Analysis
- Decision
- Justification



### AGENT BEHAVIOR GUIDELINES

- Be accurate
- Be concise
- Ask when uncertain
- Cite sources
- Follow policies

### REASONING PATTERNS

Understand  
↓  
Plan  
↓  
Execute  
↓  
Verify  
↓  
Respond



### INVENTORY CHECK PROCEDURE

- Identify SKU
- Check Locations
- Validate Stock
- Return Availability



### REORDER LOGIC TEMPLATE

- Demand Signal
- Safety Stock
- Lead Time
- Reorder Point



### EXCEPTION HANDLING PATTERNS

- Detect Issue
- Assess Impact
- Recommend Action
- Escalate if needed




### THINKING STRUCTURES

#### CHAIN OF THOUGHT

Step 1 → Step 2 → ... → Step N

#### TREE OF THOUGHT



#### REFLECTION LOOP

Plan → Act → Review

### PROMPT ENGINEERING PRINCIPLES

- Clear is kind
- Specific beats vague
- Structure drives quality
- Examples clarify intent
- Iterate and improve



MA PER AVERE UN PÒ DI  
INFORMAZIONI DEVO SEMPRE  
CHIEDERE AL MIO IT DI  
AGGIORNARE L'ERP?





PERCHÉ  
NON UNA CHAT?

- FOCUS
- ARCHITECTURE
  - CONTEXT
  - CAPABILITIES
  - AUTONOMY

#4<AI>





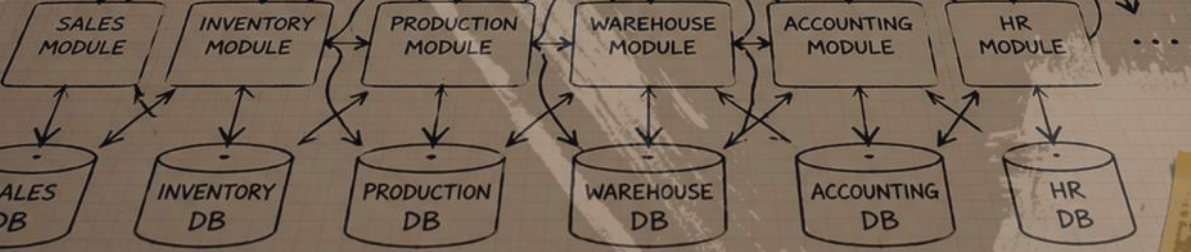
### WHY THIS IS A PROBLEM

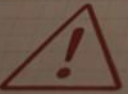

- CHAT KNOWS EVERYTHING
- HARD TO MAINTAIN
- CHANGE = BREAK
- NO SCALABILITY
- NO BOUNDARIES

TODO:  
- FIX  
- TEST SHIP

THIS WILL NOT SCALE

CHAT MODULE  
- LLM  
- PROMPT ENGINE  
- TOOL CALLING

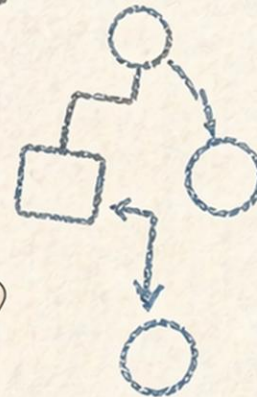


 TIGHT COUPLING = BAD 

#4<AI>

It's  
my turn!

PRACTICAL TIME



- 
- 
-

# MCP COME PROTOCOLLO

MCP NON E' UN TOOL.

E' IL PROTOCOLLO CHE PERMETTE AI MODULI DI COMUNICARE.

IL TOOL CALLING E' SOLO UNA CONSEGUENZA.

MCP È IL CENTRALINO. NON FA IL LAVORO. COLLEGA.

**MCP**  
(MODEL CONTEXT PROTOCOL)

COMMUNICATION LAYER

- ✓ STANDARDIZZA LE COMUNICAZIONI
- ✓ SCOPRE LE CAPABILITÀ
- ✓ ABILITA L'INTERAZIONE
- ✓ DISACCOPIA I MODULI



**SALES MCP SERVER**  
CAPABILITIES

**INVENTORY MCP SERVER**  
CAPABILITIES

**WAREHOUSE MCP SERVER**  
CAPABILITIES

**PRODUCTION MCP SERVER**  
CAPABILITIES

**ACCOUNTING MCP SERVER**  
CAPABILITIES

ESPONE LE SUE CAPABILITÀ

OGNI MODULO HA LE SUE REGOLE

MCP NON CONOSCE I DETTAGLI

MCP COORDINA LA COMUNICAZIONE

LAVORANO INSIEME, MA SENZA DIPENDENZE

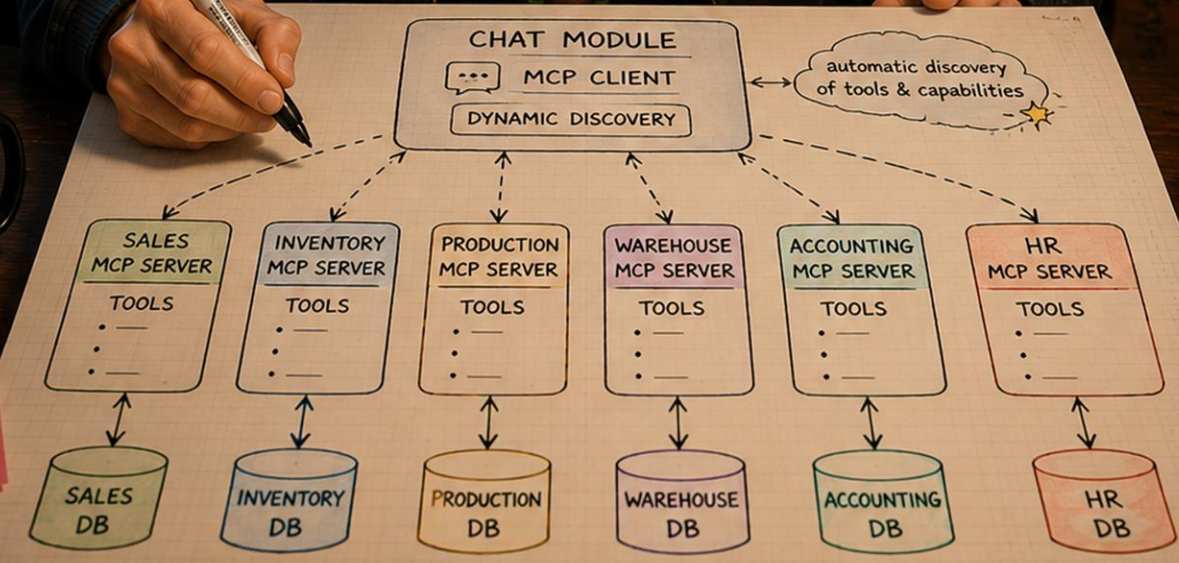
NO COUPLING  
NO DIRECT ACCESS  
JUST PROTOCOL  
😊

DESIGNING DISTRIBUTED SYSTEMS  
DOMAIN-DRIVEN DESIGN  
Distilled  
PATTERNS OF ENTERPRISE APPLICATION ARCHITECTURE



- GOOD ARCHITECTURE
- ✓ LOOSE COUPLING
  - ✓ DISCOVERY
  - ✓ OWNERSHIP
  - ✓ CONTEXT BOUNDARIES
  - ✓ AUTONOMY
  - ✓ SCALABILITY

- PRINCIPLES
- ☑ CONTEXT OVER DATA
  - ☑ CONTRACTS OVER CODE
  - ☑ CAPABILITIES OVER IMPLEMENTATION
  - ☑ AUTONOMY OVER CONTROL



CODE.  
CAFFEINE.  
CHAOS.

LOOSE COUPLING  
HAPPY SYSTEM  
😊

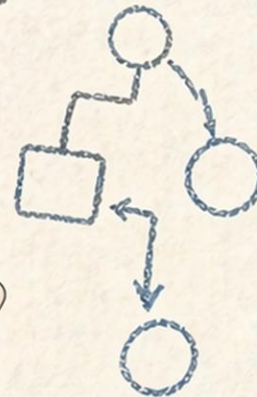
MCP =  
CONTRACTS  
NOT  
COUPLING  
❤️

Domain-Driven Design  
Distilled  
Implementing Domain-Driven  
Design  
BUILDING MICROSERVICE  
Sam Newman

CONTEXT  
BOUNDARIES  
ROCK ☆

It's  
my turn!

PRACTICAL TIME



- 
- 
-

# MCP

## IL SISTEMA NERVOSO DEL TUO SISTEMA

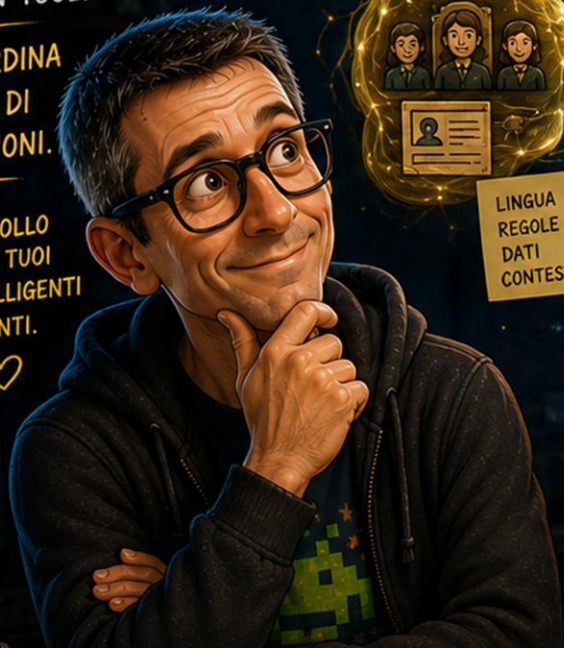
MCP NON ESEGUE IL LAVORO.

NON CONTIENE I DATI.

NON E' UN TOOL.

MCP COORDINA IL FLUSSO DI INFORMAZIONI.

E' IL PROTOCOLLO CHE RENDE I TUOI MODULI INTELLIGENTI E INDIPENDENTI.



LINGUA  
REGOLE  
DATI  
CONTESTO

SALES



NON SONO LE API.  
NON SONO I DATABASE.  
E' IL FLUSSO DI INFORMAZIONI  
CHE CONNETTE TUTTO.

INVENTORY



LINGUA  
REGOLE  
DATI  
CONTESTO

WAREHOUSE



LINGUA  
REGOLE  
DATI  
CONTESTO

# MCP

(MODEL CONTEXT PROTOCOL)

LINGUA  
REGOLE  
DATI  
CONTESTO

HR



PRODUCTION



LINGUA  
REGOLE  
DATI  
CONTESTO

ACCOUNTING



LINGUA  
REGOLE  
DATI  
CONTESTO

OGNI MODULO E' INDIPENDENTE.  
OGNI MODULO HA LA SUA IDENTITA'.  
MCP CREA LE CONNESSIONI.

L'INTELLIGENZA FLUISCE. ☆

MCP = PROTOCOLLO.



NON ACCOPPIA.  
COORDINA.  
ABILITA L'INTELLIGENZA.



FLUSSO  
NON  
ACCOPIAMENTO



# BREWUP.MOTHER

ORCHESTRATOR & HOST

## SALES AGENT

FOCUS: CUSTOMERS & REVENUE

### ORDERS

- #SO-89342
- #SO-89343
- #SO-89344
- ...

### CUSTOMERS

- ...

### FORECAST

↑ 23% vs last month

### LARGE ORDER

#SO-89342  
€ 125,000

STATUS RECEIVED

### PRODUCTS

...

### PRICING

€

### ROUTING

### CONTEXT

### MEMORY

### DISCOVERY

### POLICIES

### LOGGING

## INVENTORY AGENT

FOCUS: STOCK & AVAILABILITY

### STOCK CHECK

✓

### AVAILABILITY

OK

### REORDER SUGGESTION

...

### AVAILABLE STOCK

1,250 items

### WAREHOUSE 02

680 units

### WAREHOUSE 04

570 units

...

### RESERVATIONS

...

## MCP

MODEL CONTEXT PROTOCOL  
THE NERVOUS SYSTEM OF YOUR DIGITAL ORGANIZATION

### AGENT COMMUNICATIONS

- SALES AGENT → INVENTORY AGENT  
Check availability for #SO-89342
  - INVENTORY AGENT → SALES AGENT  
Availability confirmed: 1,250 items
- STATUS: COMPLETED ✓

### MCP SERVERS (CAPABILITIES)

- CRM
- PRICING
- CATALOG
- INVENTORY
- WAREHOUSE
- SHIPPING
- FINANCE
- ...

THIS IS NOT TOOL CALLING.  
THIS IS AGENT-TO-AGENT COLLABORATION.

### AUTONOMOUS SPECIALIZED COLLABORATIVE

FROM CHAT TO COLLABORATIVE INTELLIGENCE

### SHARED CONTEXT SHARED GOALS SHARED SUCCESS

## DOMAIN DECIDES

DECISIONS EMERGE FROM THE DOMAIN, NOT FROM THE TOOL.

### DOMAIN DECISION

The right action, in the right context, at the right time.

## AGENT CORRELATES SIGNALS

AGENT INTELLIGENCE CORRELATES SIGNALS, UNDERSTANDS CONTEXT, AND MAKES SENSE OF THE WHOLE.

### AGENT INTELLIGENCE

- Correlate
- Interpret
- Reason
- Plan

## MCP EXPOSES CAPABILITIES

MCP IS THE NERVOUS SYSTEM THAT CONNECTS AND EXPOSES CAPABILITIES IN A STANDARD WAY.



## BOUNDED CONTEXT OWNS TRUTH

TRUTH LIVES IN THE DOMAIN. EACH CONTEXT IS AUTONOMOUS, CONSISTENT, AND TRUSTED.

# Domain-Driven Decision Architecture



MCP come Modello Architeturale: dal Tool Calling ai Sistemi  
Autonomi

## SPEAKER



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### Connect

