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# The Rise of Full Stack Employees

NVIDIA GTC ‘24

# The Rise of Programming Syntax

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ComputerHope.com

# Semantics for common Syntax

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**Algorithm 1:** Timsort

**Input:** Unsorted collection
**Output:** Sorted collection
`// Calculate run length`
$runLength$ := calculateRunLength($array$);
`// Perform insertion sort on each run`
**for** $start \leftarrow 0$ **to** $array.length$ **by** $runLength$ **do**
  $end$ := min($array.length - 1$, $start + runLength - 1$);
  insertionSort($array$, $start$, $end$);
**end**
`// Recursively merge adjacent runs`
$mergeSize$ := $runLength$;
**while** $mergeSize < array.length$ **do**
  **for** $left \leftarrow 0$ **to** $array.length$ **by** $size * 2$ **do**
    $mid$ := $left + size - 1$;
    $right$ := min($array.length - 1$, $left + (2 * size) - 1$);
    **if** $mid < right$ **then**
      merge($array$, $left$, $mid$, $right$);
    **end**
  **end**
  $mergeSize$ := $mergeSize * 2$;
**end**

```
[4, 3, 0].sort()
```

# Semantics for common tasks

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"Create a web server" → Django, Flask (web developer) →

```
@app.route('/')
def hello_world():
    return 'Hello World'
```

"Plot users' churn trends" → Pandas, Dask (data scientist) → `user_churn.plot()`

"Display all users in the db" → ActiveRecord (backend eng) → `User.all`

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% of “Full Stack Eng” in StackOverflow report:

- **2012:** 0%
- **2022:** **46%**

Semantic abstractions made every engineer 10x more productive and able to move across the stack to get work done.

# LLMs are the semantic layer for all tasks

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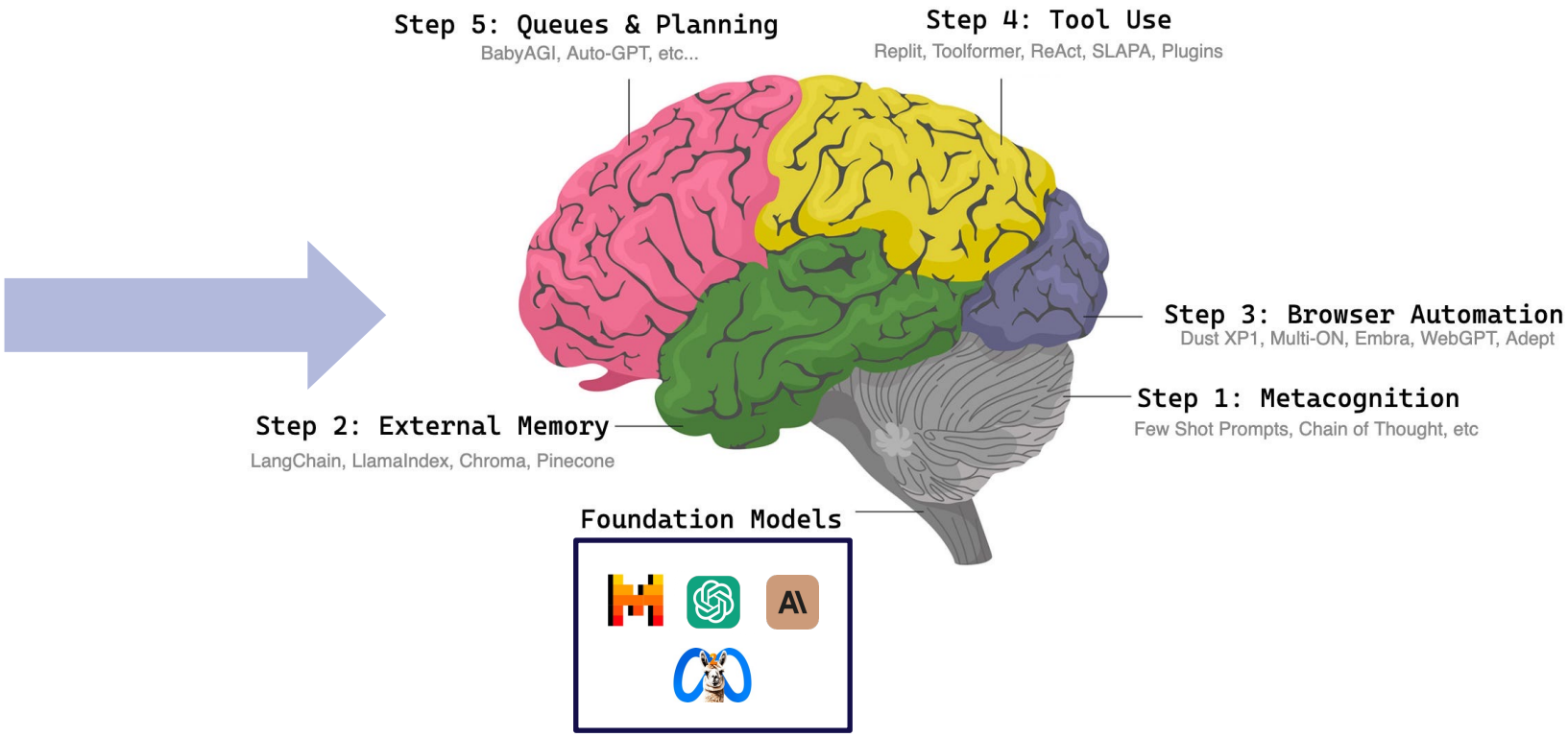
“Create a contract proposal”

“Analyze this security alert”

“Write a press release for X feature”

“Make my laptop more secure”

“Do a risk analysis for NVDA stock”



# Rise of the “Full Stack Employee”

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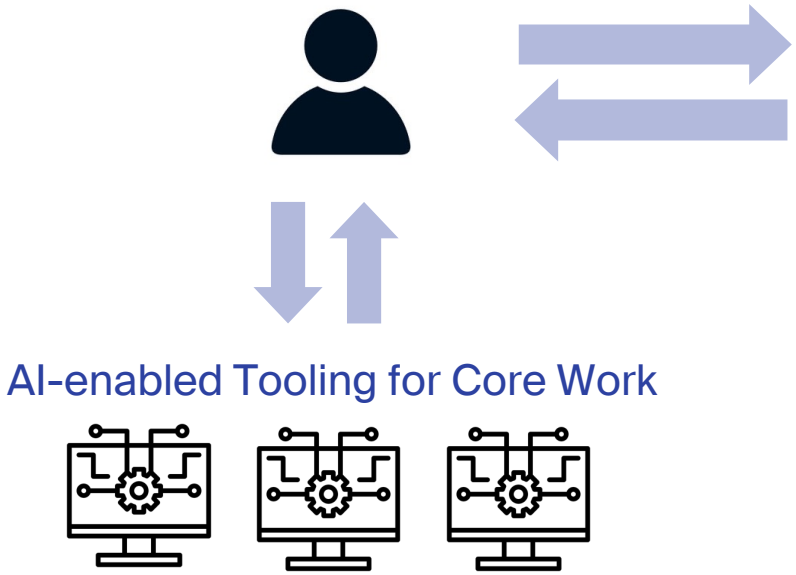
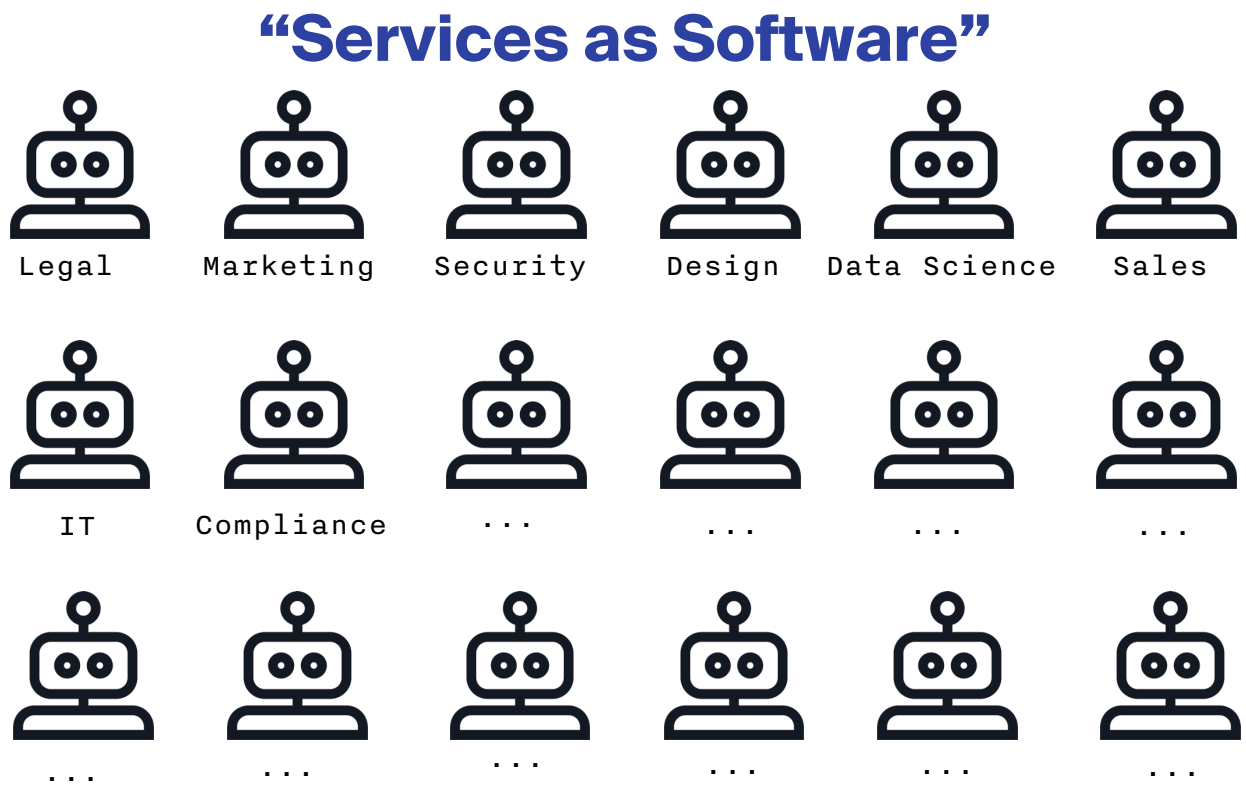
LLMs and agents will give every employee the ability to do work across the stack if needed.



% of “Full Stack Employees” in enterprises:

- **2024:** 0%
- **2034:** ??%