

NTS: Programming Languages and Paradigms

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A new, more powerful successor
to T_EX-the-typesetter.

Objectives



```
graph LR; A[Objectives] --> B[A new, more powerful successor to TEX-the-typesetter.]; A --> C[An effort to re-program TEX-the-program.]; style B stroke:#008000,stroke-width:4px; style C stroke:#800000,stroke-width:4px;
```

Objectives

A new, more powerful successor
to T_EX-the-typesetter.

An effort to re-program T_EX-the-program.

A procedural language based on a formal syntax and well-defined semantics.

Objectives

Pascal



A procedural language based on a formal syntax and well-defined semantics.

Objectives

Structured programming as a methodology.

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Building large programs from manageable smaller components.

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Building large programs from manageable smaller components.

Abstract data structures instead of just the data types provided by architectures.

A procedural language based on a formal syntax and well-defined semantics.

Objectives

Structured programming as a methodology.

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Building large programs from manageable smaller components.

Abstract data structures instead of just the data types provided by architectures.

Portability to different platforms.

Introducing the world to literate programming.

Objectives

Pascal

Knuth's
choices



Introducing the world to literate programming.

Extending Pascal by pre-processing the source code.

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Introducing the world to literate programming.

Extending Pascal by pre-processing the source code.

Tangling a WEB and weaving the documentation.

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Introducing the world to literate programming.

Extending Pascal by pre-processing the source code.

Tangling a WEB and weaving the documentation.

Arithmetic calculations and memory management built in to guarantee portability.

Objectives

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Knuth's choices

Extending $\text{T}_{\text{E}}\text{X}$ is not that easy.

Objectives

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20 years later

Extending $\text{T}_{\text{E}}\text{X}$ is not that easy.

Successors of Pascal didn't make it.

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Extending $\text{T}_{\text{E}}\text{X}$ is not that easy.

Successors of Pascal didn't make it.

Even Knuth has moved to C.

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Extending $\text{T}_{\text{E}}\text{X}$ is not that easy.

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Hardware is no longer a constraint.

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Extending $\text{T}_{\text{E}}\text{X}$ is not that easy.

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Even Knuth has moved to C.

Hardware is no longer a constraint.

$\text{T}_{\text{E}}\text{X}$ data structures have become time bombs.

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Extending T_EX is not that easy.

Successors of Pascal didn't make it.

Even Knuth has moved to C.

Hardware is no longer a constraint.

T_EX data structures have become time bombs.

T_EX's monolithic, interwoven character has become a burden.

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Extending T_EX is not that easy.

Successors of Pascal didn't make it.

Even Knuth has moved to C.

Hardware is no longer a constraint.

T_EX data structures have become time bombs.

T_EX's monolithic, interwoven character has become a burden.

We need to re-create T_EX using modern methodologies and technologies.

Objectives

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Knuth's choices

20 years later

Removing all constraints and most complexity.

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20 years later

Options



Removing all constraints and most complexity.

Adding modularity and clear interfaces.

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Options

Removing all constraints and most complexity.

Adding modularity and clear interfaces.

Functional programming would suit
T_EX's basic manipulations: Lisp?

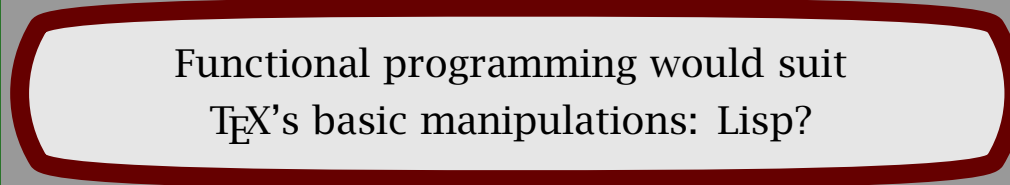
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Functional programming would suit
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Logic programming would help us specify
and solve typographic problems: Prolog?

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Procedural programming along the
lines $\text{T}_{\text{E}}\text{X}$ is coded now: C and C++?

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Procedural programming along the
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The portable compromise, procedural
programming while using objects: Java!

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Options

Provide a high level of structure
using objects and methods.

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Options

NTS in Java

Provide a high level of structure
using objects and methods.

Anchor NTS in the World Wide Web.

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Options

NTS in Java

Provide a high level of structure
using objects and methods.

Anchor NTS in the World Wide Web.

Support as many platforms as possible.

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Options

NTS in Java

Provide a high level of structure
using objects and methods.

Anchor NTS in the World Wide Web.

Support as many platforms as possible.

Use standardized interfaces.

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NTS in Java

Provide a high level of structure
using objects and methods.

Anchor NTS in the World Wide Web.

Support as many platforms as possible.

Use standardized interfaces.

Move from WEB to WWWeb.

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NTS in Java