The future belongs to well-designed low-level general-purpose languages, and a handful of DSLs

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Every feature in modern programming languages can be viewed as a mechanism to express commonality and variation. A quick look at popular languages shows that they can express only a small number of configurations of commonality and variation based on structure, type, function, and a few other primitive concepts. To make these concepts less primitive and to extend them into concepts of the domain discourse is to build a domain-specific language.

One can argue that history has demonstrated the primitive concepts to be adequate to express design, though they can be helped with some syntactic aspartame that is more an issue of good taste in language design than in anything technical or theoretically based. To go the other direction and to express commonality and variation in domain-specific languages has a poor track record when the language inventory grows beyond shared notions of the broad culture (as one finds in DSLs such as yacc, lex, and bison). The problems of wholesale DSLs are many, as born out by a decade of experience at Bell Laboratories and other companies which have tried these techniques on a large scale:

- while one can build a language translator in an afternoon, it takes years to design a good language
- the translator alone isn't enough: you need debuggers, browsers, source analyzers, re-factoring tools, configuration management tools, and a host of other tools that aren't so easy to build, and the cost/benefit analysis starts to look less attractive
- a culture based on more than two or three languages provides a shocking learning curve to new employees. incurring high costs and errors
- the higher-level the expression, the more brittle a language is with respect to change -- which is why low-level languages survive and very high-level languages die out

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