

# A Typology for Generating Needs Assessments

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**Abstract.** There are many techniques available to the developer who is attempting to understand a performance problem. Needs assessment is one of those techniques. The developer can interview, distribute questionnaires, ponder extant records... But what questions does the developer ask? Which behaviors should be observed? What feelings and priorities are sought? The challenge for developer is in the conception of the substance of individual items and groups of items. This article presents a typology which guides the developer in creating needs assessment items, the building blocks of front end analysis.

## Introduction

Everyone agrees on the importance of understanding a problem before trying to solve it. The instructional development literature reflects this unanimity, providing developers with frequent and resounding calls to wage analytical wars on performance problems. Major and minor skirmishes are undertaken in the name of *front end analysis* for the worthy purposes of determining whether or not there really is a problem, who thinks there is a problem, the magnitude and priority of the problem and whether or not the problem will be susceptible to training solutions. These purposes are served through several analysis and assessment techniques which are carried out before objectives, specifications, and software are developed.

While the merit of problem or front end analysis is never in doubt and tools like critical incident, task, subject matter, goal and needs analysis are much touted, not all of these analyses enjoy equally detailed prescriptions. Nowhere is the presence of fervor and the absence of prescriptive detail more obvious than

in the topic of needs assessment. As developers concur with the persuasive works of Joe Harless (cited in Littledale, 1975) and Roger Kaufman (1977), they are confronted with the reality of what Earl Misanchuk (1982) called a "field awash with adjectives." (p.1)

This paper presents a model for generating needs assessments. I am calling the activities which developers undertake to find out what *learners* think and feel *needs assessment*. The developer's challenge is to build print, observational and interview instruments which glean useful data from participating learners. This paper will review needs assessment history and extant techniques and offer a model for determining the substance of a needs inquiry.

## Background

Kaufman and English (1979) join John Dewey (1933, 1939) to emphasize the importance of determining learner needs prior to developing curriculum for that learner. The link between Dewey and contemporary theorists is Ralph Tyler's curriculum rationale (1949). Monette (1977) notes that Dewey influenced Tyler's work and Miles (1979) identifies Tyler as the basis for current needs thinking. However, while John Dewey espoused the heresy of basing education on what children themselves perceived that they needed, he never clarified needs assessment. Archambault (1957) provides what appears to be one of the earliest lamentations on the absence of specific heuristics for needs assessment. He also introduces three themes which appear in the needs assessment literature: the question of the value of a curriculum built primarily on learner perception of needs; the importance of need prioritization; and the inclusion of attainability as a key variable in needs determination.

The desire to base curriculum decisions first and foremost on learner needs was supported by Federal mandates in the mid and late 1960s. Sallis and Hengeller (1980) describe a 1963 Federal

requirement that Community Mental Health Centers do needs assessments prior to receiving federal support. Federal education agencies followed suit; Witkin (1977) reports that in 1965 needs assessments were required to receive ESEA funding.

This dominant presence of the learner in need determination is typified by going to the learner with an unrestricted universe of possible areas of need and asking, "What do you need?" Kaufman (1978) called that an alpha assessment; it serves as the theoretical basis for open-ended inquiry and contrasts with what he calls beta assessment. This is the first problem that developers confront as they construct needs assessment instruments. How much do they restrict the universe of possible needs? In what order are sources consulted to participate in that process? Finally, who has the last word in selecting one need over another? Figure 1 depicts the challenges. Each successive source narrows the needs and is in turn exposed to a diminished field of possible needs. While the first source enjoys the power of defining which or what kind of needs to be investigated, the last source is closest to that final selection of need (N) to be addressed.

James (1956), McGehee and Thayer (1961), and Moore and Dutton (1978) urge front end analysis which relies first and foremost on how the organization (management) perceives needs. Deden-Parker (1980) offers an excellent case study which models the challenge of integrating management's perspective with behavioral task analysis. In her work,

the organizational perspective on optimal performance is dominant.

When trying to define needs, the developer usually solicits opinions on optimal and actual conditions *from many perspectives*. Knowles (1970) and Kaufman and Stakenas (1980) focus the developer's attention on still another source for opinions on learner needs: society. Kaufman and Stakenas (1980) turn that source into the ultimate optimal, *a better society*, and operationalize it as being made up of *self-sufficient learners*. More a contribution to the Reagan era than to the needs assessment literature, their ideas are significant, as well as controversial, for summative evaluators as a criterion against which to measure the performance of schools.

#### Techniques for Finding Needs

The search for substantive tools to determine needs continues, regardless of which sources are asked first or most. The literature provides some guidance. Steadham (1980) and Newstrom and Lilyquist (1979) detail criteria for selecting needs assessment techniques. Steadham's criteria are useful: time, resources, client involvement, politics, learner vs. client perception of needs, and confidentiality of data. Steadham lists analysis techniques (e.g., observations, tests, interviews, etc.) and their advantages and disadvantages in light of these criteria. Sallis and Hengeller (1980) dichotomize needs assessment approaches into hard and impressionistic techniques. They describe the methods mental health professionals use to ascer-

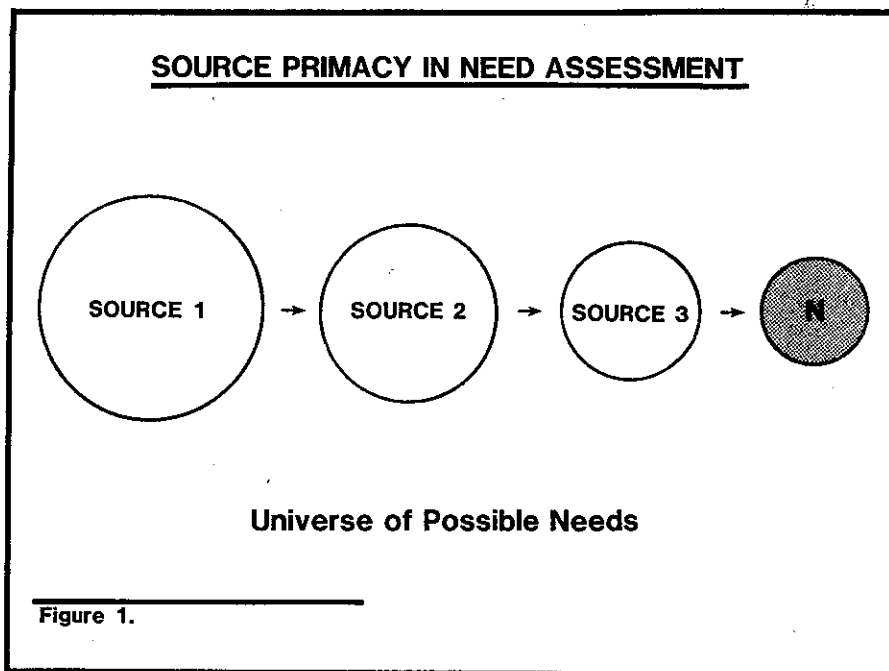
tain community mental health needs. Nickens, Purga, and Noriega (1980) plumb the market research literature for needs techniques and describe the key informant, community forum, rates-under-treatment, social indicators, and survey methods.

Moore and Dutton (1978) credit McGehee and Thayer (1961) with the introduction of an idea which is crucial to front end analysis. That is the notion of levels of analysis, of repeated studies of increasing detail involving more and varied sources. Zemke (1981) divides sources into primary and secondary sources; primary data is gathered from learners directly or through observation of them and secondary data comes from other's opinions about learner performance. An interesting distinction is drawn by Inderlied and Bates (1980) when they define primary data as new information and secondary data as information gleaned from extant sources like accident reports and attendance figures.

While these authors focus on *how and where* to investigate, Kaufman (1977), Kaufman and English (1978) and Kaufman and Stakenas (1980) call the developer's attention to *when to seek gaps between optimal and actual circumstances*. Kaufman and his colleagues urge examination of gaps between desirable and actual conditions throughout the process of instructional systems development. While gaps can occur at all stages in an instructional system, they press for restriction of the word *need* to gaps in the results of the system, in products, outputs, and outcomes. Thus evaluation and front end analysis are appropriately linked through what they call the Organizational Elements Model of needs assessment.

#### Techniques for Selecting Needs

The literature offers more guidance to the developer who is attempting to *prioritize and select* a need than to the developer who is identifying needs. Since selected need(s) serve as the basis for the goals of education and training programs, most authors acknowledge the importance of first finding and then prioritizing needs. Moore and Dutton (1978) compliment Thomas Gilbert for his work on selection of training needs. Gilbert determines priority training needs by multiplying the value of overcoming the discrepancy times the number of trainees and dividing by the cost of training. Unfortunately, this formula, like so much of the literature, suffers from a lack of prescriptive detail.



What is the value of erasing a particular need? What does it cost not to address a need? This complex and political question has been answered differently by many authors. Three factors emerge from the literature:

*Size of Discrepancy.* A comparison between optimal and actual yields the magnitude of the problem. While this sounds simple, it isn't. As Misanchuk (1982) noted, more progress has been made in assessing the trainee's current abilities than in determining and quantifying desirable outcomes. Consider Tyler's (1966) work on the National Assessment for Educational Progress and Sweigart's 1977 Atlanta study of what children were able to do. Those extensive efforts at assessing status quo performance stand in contrast to ill-defined compilations of desirable outcomes.

*Attainability.* Kimpston and Stockton (1979) criticize selecting needs based only on size of the discrepancy. They and McNeil and Laosa (1975) cite likelihood of success as an important component in need prioritization. These pragmatists see force field analysis as a tool for needs assessment.

*Perceived Value through Rating and Ranking.* Sources are often asked to rate or rank their opinions about needs. Ranking involves comparing each identified need with the others and putting them in some kind of order. Rating involves comparison with a standard; many needs can be rated as a major priority, some priority, or no priority at all. Ranking, if a limited number of choices are provided, causes the developer few problems. Rating is the challenge. On what standard do you rate? McNeil and Laosa ask respondents to rate 15 goals on "tradition fundamentals," future significance, ability of the organization to achieve, and contribution to cultural pluralism. A tri-partite needs model is described by Misanchuk (1982). He asks respondents to rate each need on its relevance, learner competence, and desirability. Techniques for rating and ranking are described by Russell, Plakos, and Cox (1978) and Marshall, et al. (1982). Oppenheimer (1982) presents an interesting management development case study. He found significant positive correlation ( $p^5.001$ ) between ratings and rankings using Spearman Rank Order Correlation. Thus he suggests that either rating or ranking could be used to determine source priorities.

### A Typology for Needs Assessment

There are numerous techniques available to the developer who is conducting needs assessments. One can interview, observe, distribute questionnaires, and ponder extant records. But what questions does the developer ask? Which behaviors are observed? Which feelings are sought? The challenge is at the item level, as the developer creates the small building blocks of assessment instruments which will serve to structure the inquiry.

The purpose of front end analysis is to better understand the performance problem. What does "better understanding" mean? What is the information the developer needs from all sources, and in this case, the learners themselves? The answer to these questions provides the basis for systematic construction of needs assessment instruments.

The needs assessment typology is based upon the purposes of front end analysis. Each purpose corresponds to a type of item. There are five general purposes and five types of items. Figure 2 presents this relationship. Since needs assessments are done for as many as five purposes or just a few or for only one of the possible purposes, instruments are assembled after the developer has figured out what the purpose of this particular query is.

#### Type 1: Problem Finding

This question type seeks the nature of the problem. The developer confronts two possible challenges: finding problem(s) and finding details of a particular problem. Finding problems is an alpha assessment activity occurring, for

example, when a community college program planner conducts a survey to find out what enrichment courses are desired by his/her constituency. Developers will more frequently find themselves conducting a search for the details of a given problem—an activity Kaufman calls a beta inquiry. A developer who is told to build a training program for hotel night clerks on how to use a new computer software package will conduct a beta search for details on the pre-specified problem.

Type 1 questions ask, "Is there a discrepancy?" "What is the discrepancy?" and "What is the exact nature of the discrepancy?" Note that the developer is narrowing in to acquire information which will enable development to occur.

Examples:

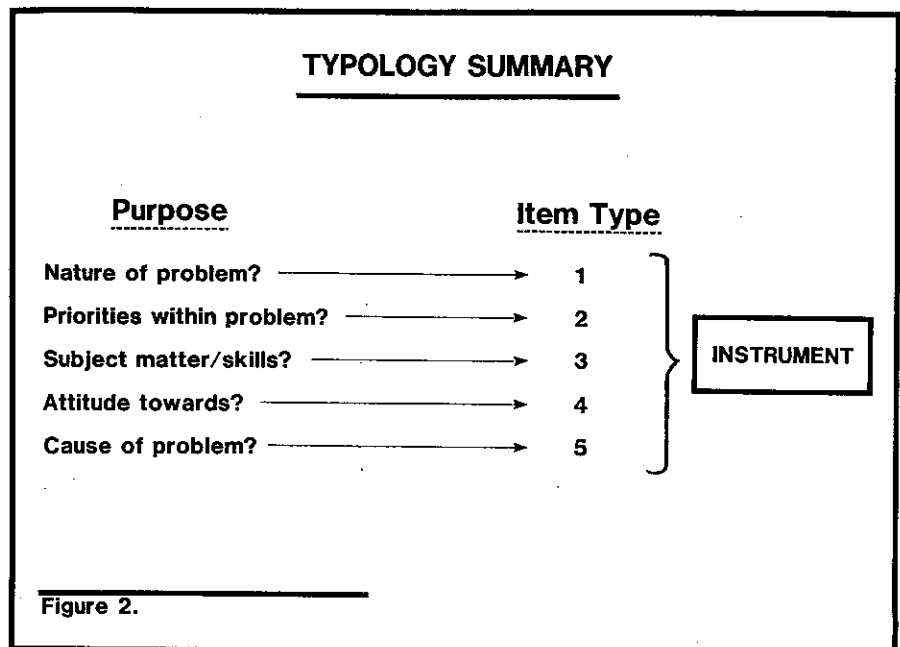
1.1 What experiences have you had which have led you to enroll in this engine safety class?

1.2 Fill in the following as honestly as you can: "When I go for a job interview, I worry that I will..."

1.3 "Compared to other job seekers, I think that I..."

1.4 You are taking a seminar called *Contract Negotiation for Instructional Developers*. List the questions that you have about this topic.

1.5 It is Friday. You will be going on a job interview on Tuesday. There are many ways to prepare to succeed at this interview. Look at the list that follows. Check as many of the listed items as *concern you*. Feel free to check as many or as few as you think you would like to learn more about.



- where to get information on the company
- what to wear to the interview
- how to understand their annual report
- how to project a more professional image
- what to take to the interview
- whether to ask for feedback
- add any others that concern you as you prepare to interview.

## Type 2: Problem Selecting

Type 2 questions press respondents to prioritize and select from among several needs or facets of one need. The developer has to decide what directions to give the learner. Do you want prioritization by size of problem, solution efficacy, and/or the benefit(s) which might be derived from erasing the particular need? Often developers avoid this issue. They ask for ranking and even rating without distinguishing the exact variable on which they are asking respondents to judge. Another interesting question which arises is whether to ask people to respond on the basis of their own needs and/or their perceptions of other's needs. It is a distinction which must be made clear within the needs assessment.

Examples:

2.1 Mark the skills below with the number which reflects how important it is to you that you know how to do it. 2: Important; 1: Of some importance; 0: Not important.

- a. cleaning the bronchoscopy equipment
- b. explaining the procedure
- c. setting the machine up when stored
- d. carrying out routine, daily maintenance
- e. carrying out monthly maintenance
- f. being able to diagnose when to call a repairperson
- g. storing the machine after usage
- h. describing job functions of staff involved with the machine

2.2 Please look at the list above and think about the other orderlies and attendants with whom you work. Where are they having problems with the new bronchoscopy equipment? Place the letter of the skill next to the works which best describe how they are doing.

- Biggest problem
- Next biggest problem
- Third biggest problem

2.3 Which of the above (question 2.1)

are you best at doing? Put the letter here:

2.4 Which of the above (question 2.1) causes you the most problems as you try to do your job? Put the letter here:

2.5 Rank the following skills based on how much training will contribute to your ability to get a job. Let the number 1 indicate greatest impact and the number 4 indicate least impact or no impact at all. Ability to:

- make stand up presentations
- write business and technical letters
- program in at least one computer language
- use statistical packages

## Type 3: Knowledge/Skill Proving

It is helpful to corroborate the self-report information provided by a needs assessment through the inclusion of some type 3 questions. They ask learners to perform as if they had no problem, as if the skills or knowledge central to the problem were already within their repertoire. Type 3 questions are like pre-test items and their construction assumes available, known subject matter. They differ from a pre-test in that they do not test the majority of problem-related content; rather they sample slivers of the subject matter. This will show what the learners know about themselves in relation to the problem. The value of Type 3 questions must always be weighed against the impact of asking potential learners to do something that they might not have the foggiest notion how to do.

Examples:

3.1 Please examine this resume. It was prepared by an instructional developer who is seeking employment. Render a judgement on its strengths and weaknesses. List at least three strengths and weaknesses below.

3.2 Every day of the year corresponds to an astrological sign. Match the dates below with their sign. Please the number of the sign to the left of the date.

Date of Birth	Astrological Sign
----12 May	1. Cancer
----1 February	2. Taurus
---26 August	3. Aries
---12 August	4. Libra
---4 July	5. Capricorn
---25 December	6. Pisces
	7. Leo
	8. Aquarius
	9. Sagittarius
	10. Scorpio
	11. Virgo
	12. Gemini

3.3 As you know, our hotel is welcoming more and more guests from Mexico. How might you welcome them in their own language? Don't worry about your accent or getting it exactly right. Just try to use a few appropriate Spanish words.

3.4 We are developing an instructional module to teach developers to construct needs assessments according to this typology. Write two instructional objectives which would assist you in developing this module. The objectives may be in a format which would make either Robert Mager or Robert Gagne smile.

## TYPE 4. Finding Feelings

Type 4 questions seek learner feelings about the problem. While type 1 queries will ascertain whether or not learners think there is a problem, type 4 items look for the emotions and attitudes held by learners. In addition to seeking feelings about the problem, type 4 items ask for learner attitude towards being trained in this subject matter. Consider the problem of training learners who are opposed to the job functions you plan to teach them. Imagine planning development seminars for middle managers who are mildly or strongly critical of the quality circles about which you plan to teach. It is also crucial to find out if learners feel they are ready and competent to acquire the skills or knowledge you intend to deliver. Consider the problem of training veteran reporter to compose news stories using the VDT (computerized video display terminal.) One of the things a developer needed to know prior to developing that training was that many of the reporters just didn't consider themselves the kind of people who could use new technology.

Examples:

4.1 Which best describes your feelings about taking a class on alcohol abuse and automobile safety. Check only one.

- a. Willing
- b. Unwilling
- c. Indifferent

4.2 The management development team has surveyed a random sample of middle level managers and found that more than 80% of our middle managers want to know more about quality circles. We are planning to use our corporate retreat at Lake Big Foot to conduct this experiential training. What are your feelings about participating in a two day, small group workshop for this purpose? Honestly describe your reac-

tion to this method for informing you about quality circles.

4.3 As you may already know, the district has decided to devote in-service education hours to helping teachers become computer literate. Please circle the number which most honestly reflects how you feel about the statement. Circle 2 if you agree, 1 if you are neutral or unsure, and 0 if you disagree with the statement.

1. I am looking forward to this training:

2      1      0

2. Computers can make a positive contribution to elementary education:

2      1      0

3. I feel I will be good at working with computers:

2      1      0

4. Computers are likely to dehumanize schools and classrooms

2      1      0

5. It is appropriate to use our in-service hours to acquaint teachers with computers

2      1      0

#### TYPE 5: Cause Finding

Type 5 questions ask for the cause of the problem. Do the learners think that new or increased skills/knowledge will solve the problem? Do they think it is caused by imperfect tools, incentives, or supervision? Is some combination of factors causing the problem? This is the developer's chance to find out what or who is contributing to the problem. It is not uncommon for supervisors to think training will solve a problem that learners attribute to poor management or improper tools.

Examples:

5.1 As you know, our Division is lagging far behind last year in sales of *frangaramas*. Which of the following are contributing to your problems selling *frangaramas* this year? (Check all that apply to you.)

—a. unfamiliarity with new *Frang* features.

—b. change in sales incentive plan.

—c. the fact that the 1981 top salesmen got transferred to northern Maine.

—d. improved competitive products.

—e. unfamiliarity with the way *Frang* compares to the competition.

—f. the recession.

—g. the absence of *frang* demonstrators.

—h. the *frang* has become too complex to explain to potential customers.

—i. other:

5.2 Place an asterisk beside the reason above which you think is the *major* cause for decreased corporate sales. Place only one asterisk.

5.3 I am calling you to find out why the parents of Indo-Chinese youngsters are not visiting the schools. Why do you think this is happening? What is causing Indo-Chinese parents to stay away?

5.4 The number of accidents at the plant has increased this year, in spite of a new safety committee. Why are accidents increasing this year? Please take a few minutes to describe the reason or reasons for this increase.

items already on hand? Has a subject matter, task, or critical incident analysis provided sufficient detail to feel confident about including type 3 items in a needs assessment? If a needs assessment is made up of a large percentage of type 3 items, it is possible that the developer really wants to administer a pre-test and should do just that. Type 3 items do not compensate for failure to give pre-tests. What they will do is tell you if learners know what they know and what they don't know. That has obvious design and development implications.

*Control:* Item selection also depends

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#### Item Selection

Understanding a performance problem means finding answers about what needs exist, what needs are priorities, how learners feel about the needs, the cause(s) of the needs and whether learners are accurate in their judgements of themselves in relation to the problem. These purposes for front end analysis flow from the literature and serve as the bedrock for the item typology. They also provide the basis for selecting items. The item composition of any individual needs assessment is based on the purposes of that inquiry. How much does the developer already know about the problem, about the learner, the subject matter, and their relationships? These factors determine the percentage of different item types which will appear in any given needs assessment:

*The Learner:* How much does the developer know about this learner? Will the developer be able to make repeated queries with the learner, as he/she becomes more informed? Under the best of circumstances, those situations where there is time and money to delve into what will best serve these learners, begin with type 1 and 5 questions, then add type 2 and 4 and finally include type 3 items. This assumes several opportunities to return to the learners to ask for their opinions.

*Subject Matter:* Some content is more available than others. Are there test

on who has control of learner performance and what happens to learners in the event of non-performance. If there are significant ramifications for *not* learning, then type 2 and 4 questions need not be included. That doesn't mean that it isn't a good idea to ask any and all learners for their feelings and priorities. But think about the differences in the construction of a needs interview with marine recruits, secondary school principals, older adult women, bank teller aspirants, and tenured full professors. The percentage of attitudinal and priority questions would vary based on the issue of control. This factor most influences item selection when first approaching an instructional problem and/or when brevity counts. Since lengthy instruments cost money and are often ignored by respondents, avoid the pack rat approach to needs assessment construction. The pack rat developer stuffs as many of all types of items in an instrument as possible, just in case.

#### Conclusion

I began to review the literature and ponder this problem because I was having trouble teaching my students to develop needs assessments. “Why is this content different from all others?” I wondered. Since they were mastering other front end techniques, I decided the problem was in the subject matter. Somehow it wasn't sturdy enough to

guide them in attacking each new instructional problem. This typology offers some guidance. It is a beginning.

It would be wonderful to be able to conclude this article with a report of significant differences found between the quality of needs assessments generated using this typology and other more haphazard approaches. There are no such findings. Not yet. The results of the typology are anecdotal, subjective...and real. They exist in improved instruments generated by practicing and aspiring developers; these students were kind enough to learn and use this typology on more than one hundred problems over the last eighteen months. We saw it make a difference. Better instruments were generated more quickly.

There are limitations in this presentation of the typology and the literature review. The focus here has been on querying learners for their perceptions. This purpose-based model for front end analysis can, with slight adaptation, be used to gather data from other sources like parents, supervisors, and customers. That adaptation is not included here.

This paper does not resolve the question of which source to consult first and which source shall have the last word. By focusing on a technique for assessing learner perceptions, I am urging at least some inclusion of learners in understanding their own performance problems.

Another limitation is the absence of discussion of actual item construction. There is ample tests and measurement literature to assist the developer, just as there is useful discussion of macro-techniques like interviewing and observing. (See, for example, Zemke and Kramlinger, 1982.) The greater challenge is in planning the substance of the inquiry. Just what is the developer going to find out about?

Will this typology affect the quality of education and training programs? How? Will it be cost effective? Will it provide a means to examine what we are really doing when we attempt to conduct front end analysis? Will it facilitate analysis, presentation, and comprehension of the data? These questions are not answered here and the absence of answers presents a challenge to developers. Responding to that challenge is a worthy activity since there is no more important goal for a developer than to hone the tools we use to understand performance problems.

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