RANCANGAN KAJIAN FAKTOR USAHA DALAM MEMBANGUN PANDUAN PENGEMBANGAN PERANGKAT LUNAK SEDERHANA, AKURAT, DAN DINAMIS

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Abstrak. *Panduan dalam membangun Perangkat Lunak (selanjutnya disebut PL) yang sederhana, akurat, dan dinamis merupakan sebuah proses pemikiran yang kompleks. Banyak faktor yang mempengaruhinya diantaranya adalah usaha (biaya, waktu, dan tim), konsep, metode, kondisi, dan lingkungan pengembangan PL. Usaha PL dan proses estimasi biaya dalam proyek rekayasa PL merupakan komponen yang sangat penting. Keberhasilan atau kegagalan proyek sangat tergantung pada keakuratan usaha dan jadwal estimasi(5). Manajemen proyek perangkat lunak adalah salah satu kegiatan penting dalam proses pengembangan PL. Banyak proyek pengembangan PLgagal karena buruknya pengelolaan proyek. Tujuan utama dari software tim manajemen proyek adalah untuk menghitung apa yang perlu dihitung, mengukur apa yang perlu diukur dan mempersiapkan parameter terukur untuk terus memantau dan mengelola proyek pengembangan PL(11). Estimasi usaha PL adalah salah satu yang penting pada tahap awal dari siklus hidup pengembangan PL, khususnya ketika rincian persyaratan tidak dapat diidentifikasi dengan jelas(13).*

Kata Kunci: Fuzzy Tahani, Sistem Pendukung Keputusan, Penilaian Kinerja

Penulis dalam penelitian sebelumnya mencoba melakukan pengukuran terhadap manfaat penggunaan komponen pada pengembangan PL menggunakan metrik *Function Point* dan algoritma *Bayesian Network*. Dalam Tesis tersebut penulis hanya mengkhususkan pengukuran pada perbandingan efektifitas penggunaan komponen dalam kaitannya dengan faktor usaha dalam pengembangan PL, untuk dapat memprediksi biaya pengembangan PL seakurat mungkin pada proyek PL dengan skala kecil, menengah, dan besar. Namun setelah penulis cermati kembali, hasil penelitian tersebut seyogyanya masih dapat dikembangkan lebih lanjut terutama pada kajian terhadap faktor usaha pengembangan PL.

Adapun hal yang penulis ingin ketahui antara lain:

1. Bagaimana bila setiap atribut PL dapat dijabarkan hingga ke bagian yang lebih detail
2. Dari sisi metrik yang digunakan, variasi penggunaan metrik lain yang masih dapat ditoleransi akurasinya hingga saat ini, akan memberikan hasil perhitungan yang lebih terukur(49-55).
3. Dari sisi Standar Penggajian, pada penelitian terdahulu hanya menggunakan Kelly Services Indonesia (2015). Bagaimana bila divariasikan dengan standar-standar lainnya seperti Robert Walters Indonesia (2015), Jatimprov, (2015), maupun standar lain yang layak digunakan sebagai acuan dalam bidang pekerjaan proyek PL.
4. Dari sisi kapasistas personil tim, penempatan posisi anggota tim dengan kualifikasi pendidikan Strata, Pengalaman, dan Jabatan dalam Proyek PL belum terbagi secara spesifik dan proporsional(51, hal 49).
5. Dari sisi model penggajian personil tim, pada penelitian sebelumnya hanya dihitung per bulan, bagaimana bila dapat dihitung per Jam, per hari, per minggu, per fungsi (51,hal 8), per komponen, per framework, dan lain sebagainya dengan mengacu pada hasil kajian literatur.
6. Pada penelitian sebelumnya dataset proyek PL yang didapatkan penulis maksimal hanya bernilai 100 Juta rupiah, bagaimana bila nilai proyek PL yang akan dikerjakan diatas 1 Milyar seperti pada dua procurement yang dilampirkan penulis.
7. Dari sisi teknis pemrograman, dimana pada penelitian sebelumnya tidak

dimunculkan karena yang diukur adalah fungsionalitasnya saja tanpa memperhatikan teknis bahasa pemrograman yang dipakai, lingkungan, serta kondisi proyek PL ketika sedang dibangun.

8. Dari data rekap 100 skripsi mahasiswa S1 Teknik Informatika UPN Veteran Jawa Timur yang telah dibimbing penulis dalam kurun waktu 2008-2015, penulis menemukan implementasi teknis bahasa pemrograman, framework yang digunakan, dan DBMS yang digunakan, juga berpengaruh pada besar usaha yang diperlukan dalam membangun PL.

9. Dari sisi Model Proses PL, dalam penelitian sebelumnya Model *Waterfall* saja. Bagaimana bila model yang lain seperti Evolutionery, RAD, XP, dan lain sebagainya diterapkan pada studi kasus yang sama, apakah akan memberikan hasil yang lebih optimal atau tidak.

Bagaimana mewujudkan panduan dalam pengembangan PL yang mudah dipahami, terukur, dan berkesinambungan.

Latar Belakang

Perkembanga PL dewasa ini telah sangat bervariasi. Hal ini dapat dilihat pada tren IT 2015 (gartner, 2014) yang terdiri atas Computing Everywhere, The Internet of Things, 3D Printing, 'Advanced, Pervasive and Invisible Analytics', Context-Rich Systems, Smart Machines, Cloud/Client Computing, Software-Defined Applications and Infrastructure, Web-Scale IT, dan Risk-Based Security and Self-Protection. Dari 10 tema tersebut penulis tertarik untuk membangun Panduan dalam merencanakan dan membangun Proyek PL bertemakan Advanced, Pervasive and Invisible Analytics'. Menurut (Gartner,2014) dalam tema ini, Analisis akan mengambil bagian utama pada volume data, melalui sebuah sistem yang tertanam didalam suatu aplikasi. Sekumpulan data baik terstruktur maupun tidak terstruktur, baik di dalam dan di luar organisasi akan dianalisis untuk kemudian memberikan informasi yang tepat kepada orang yang tepat, dan pada waktu yang tepat.

Penelitian ini akan membahas mengenai bagaimana merumuskan suatu kerangka kerja / panduan bagi pengembang PL, dengan sebelumnya melakukan studi literatur dan kajian terhadap faktor usaha pengembangan PL pada penelitian-penelitian sebelumnya. Pada penelitian ini penulis akan fokus menggali pada 3 isu utama pada kerangka kerja / panduan yang akan dibangun yakni Sederhana, Terukur, dan Dinamis.

Sederhana menurut asumsi penulis adalah bagaimana Panduan dapat dengan mudah untuk dipahami dan dioperasikan bila kemudian dibuatkan suatu kakas bantu yang membantu merepresentasikannya. Pada isu sederhana ini, harus jelas ranah pembahasan dan implementasi masing masing faktor pendukung PL seperti usaha, model pengembangan yang dilakukan, serta kondisi, dan lingkungan pada saat akan membangun perangkat lunak.

Terukur menurut asumsi penulis adalah bagaimana panduan dapat memberikan hasil yang seakurat mungkin dari hasil pengukuran, perhitungan, ataupun pembobotan dengan sebelumnya memperhatikan hasil implementasi beberapa metode untuk mengestimasi usaha pengembangan PL seperti *Fuzzy, Neural Network, Semantic*, (28) ataupun kombinasi dari beberapa metode bila diperlukan. Sebagai contoh bila nantinya perlu dilakukan pembobotan, maka masing -masing faktor pendukung PL seperti usaha, model pengembangan yang dilakukan, serta kondisi, dan lingkungan pada saat akan membangun perangkat lunak akan diberikan pembobotan dengan sebelumnya menentukan dasar pembobotan yang dapat dipertanggung jawabkan secara akademis.

Dinamis menurut Asumsi Penulis adalah bagaimana panduan setelah berhasil dikonsepkan secara jelas, kemudian bila perlu dibangunlah sebuah kakas bantu sebagai simulasi maupun representasi dari panduan yang akan dibangun dan dapat diupdate pengetahuannya. Pengguna nantinya akan dapat mengupdate informasi yang spesifik dengan tentunya mengikuti struktur kerangka yang telah disusun. Nantinya dapat pula dibuatkan sekumpulan petunjuk berupa notasi-notasi maupun format-format dengan ekstensi tertentu yang berfungsi sebagai input tambahan pengetahuan yang mudah diintegrasikan ke dalam panduan, maupun kakas bantunya.

Perumusan Masalah

Masalah yang akan dibahas dalam penelitian ini adalah:

1. Bagaimana menjabarkan faktor-faktor penentu keberhasilan pengembangan PL secara detail, terstruktur, dan sistematis?
2. Bagaimana memilih dan kemudian mengimplementasikan teknologi / metode, maupun permodelan yang tepat sesuai sesuai kondisi faktor-faktor pada butir (a)?
3. Bagaimana membangun Kerangka Kerja / Panduan yang sederhana, akurat, dan dinamis?
4. Bila pada butir (a).salah satu atau lebih faktor PL tidak diketahui oleh pengembang, Bagaimana memberikan masukkan kepada Pengembang berdasar pengetahuan yang telah ada pada Kerangka Kerja / Panduan pada proyek PL yang sejenis?
5. Bagaimana mengimplementasikan suatu kakas bantu yang mampu mempresentasikan Kerangka Kerja / Panduan dari butir (a) sampai dengan butir (e)?
6. Bagaimana mengukur tingkat akurasi dari hasil keluaran kakas bantu pada butir (e) dengan metode yang sesuai?

Bagaimana mengukur validitas dari kerangka kerja / Panduan yang berhasil dibangun (butir (c)) maupun dari hasil uji coba kakas bantu pada butir (f) dengan metode yang sesuai seperti kappa cohen, R-Table, dan lain sebagainya?

Hipotesa

Bila Atribut-atribut penyusun PL diinventarisasi secara detail, kemudian diterapkan Metode pengembangan PL yang terukur pada faktor usaha, maka akan didapatkan panduan pengembangan perangkat lunak yang sederhana, akurat, dan dinamis.

Metodologi

Dilakukan pemilihan terhadap pembahasan masing-masing literatur dalam kaitannya dengan faktor usaha dalam pengembangan proyek PL, dalam hal ini Adapun definisi yang dijadikan penulis sebagai constraint adalah sebagai berikut

1. Sederhana

Atribut-atribut penyusun proyek PL seperti usaha, tim, waktu, biaya, model pengembangan PL, dan metode yang digunakan dapat dengan mudah diidentifikasi dan telah jelas ranah pembahasan / implementasinya.

2. Akurat

Terdapat acuan / panduan yang jelas, serta adanya pengukuran dan perbandingan yang menyakinkan antara hasil pengukuran dengan acuan yg dipakai. Dapat juga diterapkan beberapa rumus matematik guna menentukan pola dari kajian.

3. Dinamis

Mampu mengadaptasi perubahan dan dapat ditambahkan pengetahuan tanpa merubah struktur utama.

Tabel 04. Pembagian literatur kedalam Konsep Sederhana, Akurat, dan Dinamis

Faktor	Literatur
Sederhana	3,4,6,9,11,14,15,17,19,20,21,22,25,26,27,28,29,30,31,54
Akurat	1,
Dinamis	2,
Sederhana dan Akurat	5,7,8,10,12,13,16,23,24,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69
Sederhana	Belum tersedia.
Akurat	Belum tersedia.
Sederhana, Akurat,	Belum tersedia.

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