

Analysis of Knowledge and Skills Needed for Software Architects

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I . Introduction

Software Architect

responsible architect and top developer for system development based on software technology, creating a software architecture that combines technology, business, and social influences

Businesses will continue to want a software architect who understands and connects the characteristics of job skills required for specific positions.

We attempt to examine how software architects are accepted by industries and businesses as well as identify what skills and knowledge are demanded.

II . Data

Job advertisements have been collected using a customized web crawling system, called WebMon, for job post collection. A set of webpages that contain hyperlinks for job advertisements are registered for crawling and WebMon periodically revisits them every one hour and identifies the newly posted job advertisements. We collected the job advertisements for about 5 months from April 1, 2015 to October 31, 2015.

We selected a total of 12 countries that posted architects job advertisements in English. The countries were grouped into six groups based on geographical and economic proximity.

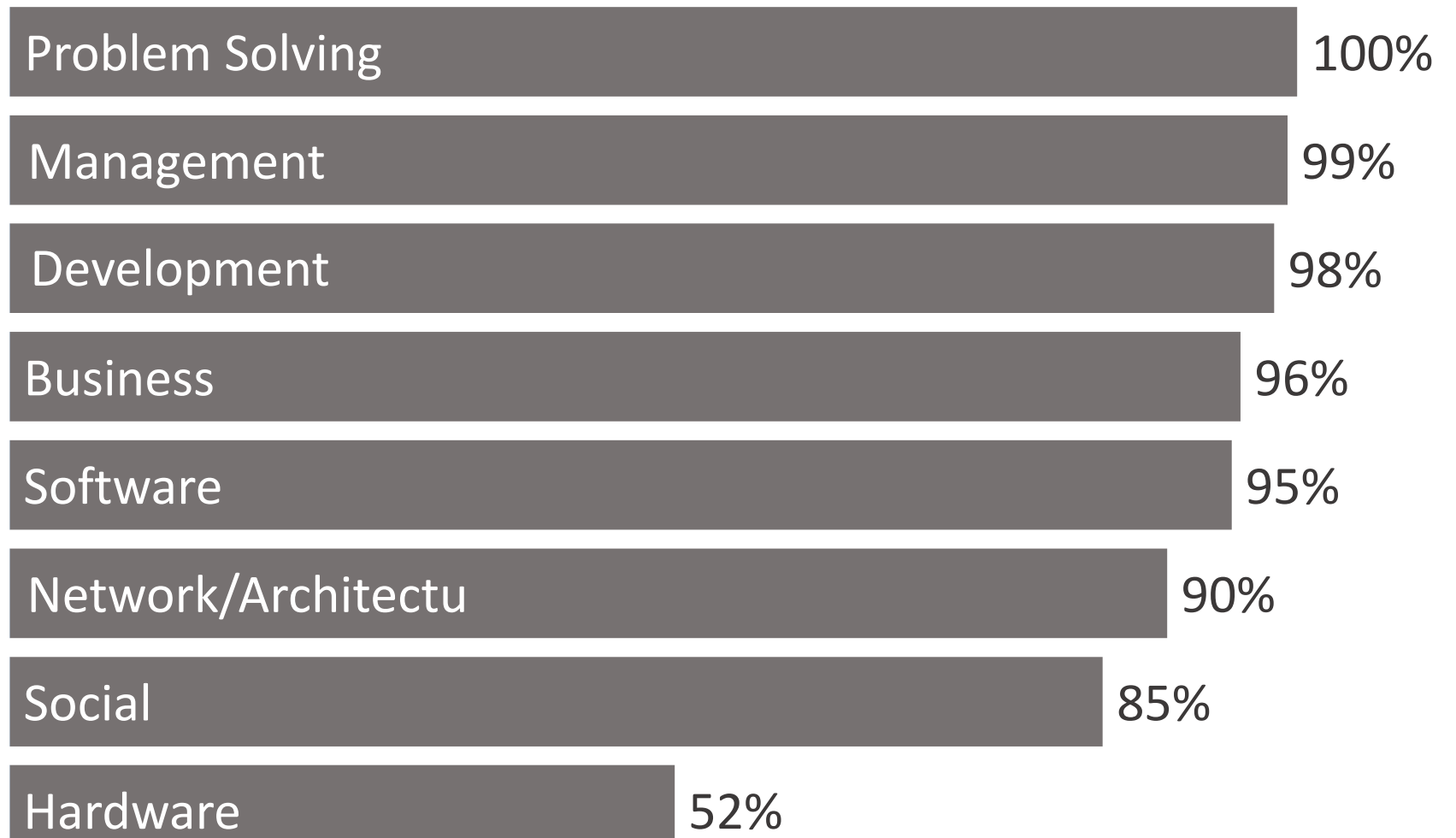
a program developed based on the Java language was used to extract data necessary for data analysis in the online job advertisement text collected by the web crawler.

Summary of data collection

Area	Country	Collected	Filtered
Asia	Malaysia,	41,748	569
	Singapore,		
	Indonesia,		
	Thailand		
	Hong Kong		
	Vietnam		
Australia	Australia	8,703	446
Europe	England	65,498	1605
	Ireland		
Gulf	Gulf	7,555	176
India	India	49,987	3,185
Canada	Canada	30,117	882
Total		206,585	6,863

III. Results

Knowledge and Skills Analysis



Top 10 Skills	Num. of Ads	% of Ads
Quantitative	6,863	100%
Knowledge of Methodologies	6,841	100%
General Knowledge of Software	5,758	84%
General Knowledge of Development	5,749	84%
Organizing	5,652	82%
Design	5,399	79%
Leadership	5,300	77%
Interpersonal	5,130	75%
Industry Specific	5,022	73%
General Management	5,022	73%

IV. Software Architect Skills

Although software skills within the technical skills category had the highest percentage after systems skills, business skills on average was higher than technical skills. Management skills was the highest category under business skills with a 99% percentage. This reflects the need for software architects to be comfortable working with others such as coworkers or team members, as well as communicating well with decision makers. Software architects need to be well rounded with not only expert hard skills, but a high importance in soft skills as well. The highest ranking of soft skills for Software architect is interpersonal skills. Software architect must be able to work closely with company executives to provide insight on a strategic level. Both team and executive relationships are supported by the Software architect's ability to communicate well and understand business. They must be highly competent in communicating with people outside their field, or the non-experts, in a clear and effective manner while addressing solutions to the problems faced by the company.

V. Conclusions

- one of the first study to investigate the newly emerging job role of a software architect from an IT researcher perspective
- implemented by developing a software tool for automatically collecting data from the top US job sites